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M9 / M9D
M11 / M11D

-020 thru -022

Self-Contained Steam Sterilizer

MIDMARK®

Service and
Parts Manual

Serial Number Prefixes:
(RN, RP, RR, RS, RT,
RV, RW, RX, RY, RZ)

M9/D
M11/D
-020 thru-022

FOR USE BY MIDMARK TRAINED TECHNICIANS ONLY

SF-1803

Part No. 004-0340-00 Rev. A3 (5/03)

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NOTE:
*The Parts List in this manual is divided into two sections **[M9 / M9D & M11 / M11D]**.*
Verify Model and refer to appropriate section.

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NOTE
*The Parts List in this manual is divided into two sections **[M9 / M9D & M11 / M11D]**.*
Verify Model and refer to appropriate section.

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General Safety Instructions

Safety First: The primary concern of Midmark Corporation is that this sterilizer is maintained with the safety of the patient and staff in mind. To assure that services and repairs are completed safely and correctly, proceed as follows:

(1) Read this entire manual before performing any services or repairs on this sterilizer.

(2) Be sure you understand the instructions contained in this manual before attempting to service or repair this sterilizer.

Safety Alert Symbols

Throughout this manual are safety alert symbols that call attention to particular procedures. These items are used as follows:

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in a serious or fatal injury. The DANGER symbol is limited to the most extreme situations.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderated injury. It may also be used to alert against unsafe practices.

EQUIPMENT ALERT

Indicates an imminently or potentially hazardous situation which, if not avoided, will or may result in serious, moderate, or minor equipment damage.

NOTE

Amplifies an operating procedure, practice or condition.

Warranty Instructions

Refer to the Midmark "Limited Warranty" printed in the Installation and Operation Manual for warranty information. Failure to follow the guidelines listed below will void the warranty and/or render the M9, M9D, M11, or M11D Sterilizer unsafe for operation.

- In the event of a malfunction, do not attempt to use the sterilizer until necessary repairs have been made.
- Do not attempt to disassemble sterilizer, replace malfunctioning or damaged components, or perform adjustments unless you are one of Midmark's authorized service technicians.
- Do not substitute parts of another manufacturer when replacing inoperative or damaged components. Use only Midmark replacement parts.

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GENERAL INFORMATION

1.1 Description Of M9 / M11 Sterilizers

A. General Description.

The M9 / M11 Sterilizers are to be used in medical and dental offices, hospitals, clinics, nursing homes, laboratories, and other facilities to sterilize heat and moisture stable reusable items (including dental handpieces) that are compatible with steam sterilization at 250°- 275°F (121°- 135°C). Follow state and federal guidelines for sterilization of single use devices.

Serviceable Components *(See Figure 1-1 & 1-2)*.

Door Opening Motor Assy. *(M9 & M11 Models Only)*
The Door Opening Motor Assembly automatically opens the door after the chamber has vented. It consists of a synchronous motor and a Normally Closed switch connected to the Main P.C. Board thru a wire harness.
• When the cam on the motor shaft is in contact with the switch, the contacts on the switch are Opened.
• Initial power to the motor is provide from the P.C. board, by-passing the switch, for a period of 12 to 30 seconds (dependent on the motor). The motor shaft and linkage rotate, opening the door.
• When the cam is not contacting (operating) the switch the contacts are Closed. Power continues to be supplied to the motor thru the closed switch.
• When the cam contacts the stop on the motor mounting bracket the motor automatically reverses direction.
• When the cam once again contacts the switch, opening its contacts, removing power to the motor, the motor stops in its original position, awaiting the next operation.
• The purpose of the switch is to assure the motor and cam always stop at the same position, ready for the next operation.

Door Switch
The Door Switch monitors position of door assembly. It is a Normally Open switch that closes when the door is closed. It prevents Initiating a cycle unless the door is closed.

Fan, Axial Flow
Thermostatically controlled fan for circulating air, in area between chamber and inside of panels, to decrease heat.

Fan Thermostat
Controls Off / On of Axial Flow Fan. Normally Open, bimetal, auto-reset, thermostat that automatically closes contacts at 122°F (50°C) to 138°F (59°C) to power Fan. Thermostat opens at 95°F (35°C) to 107°F (41°C), removing power, stopping Fan.

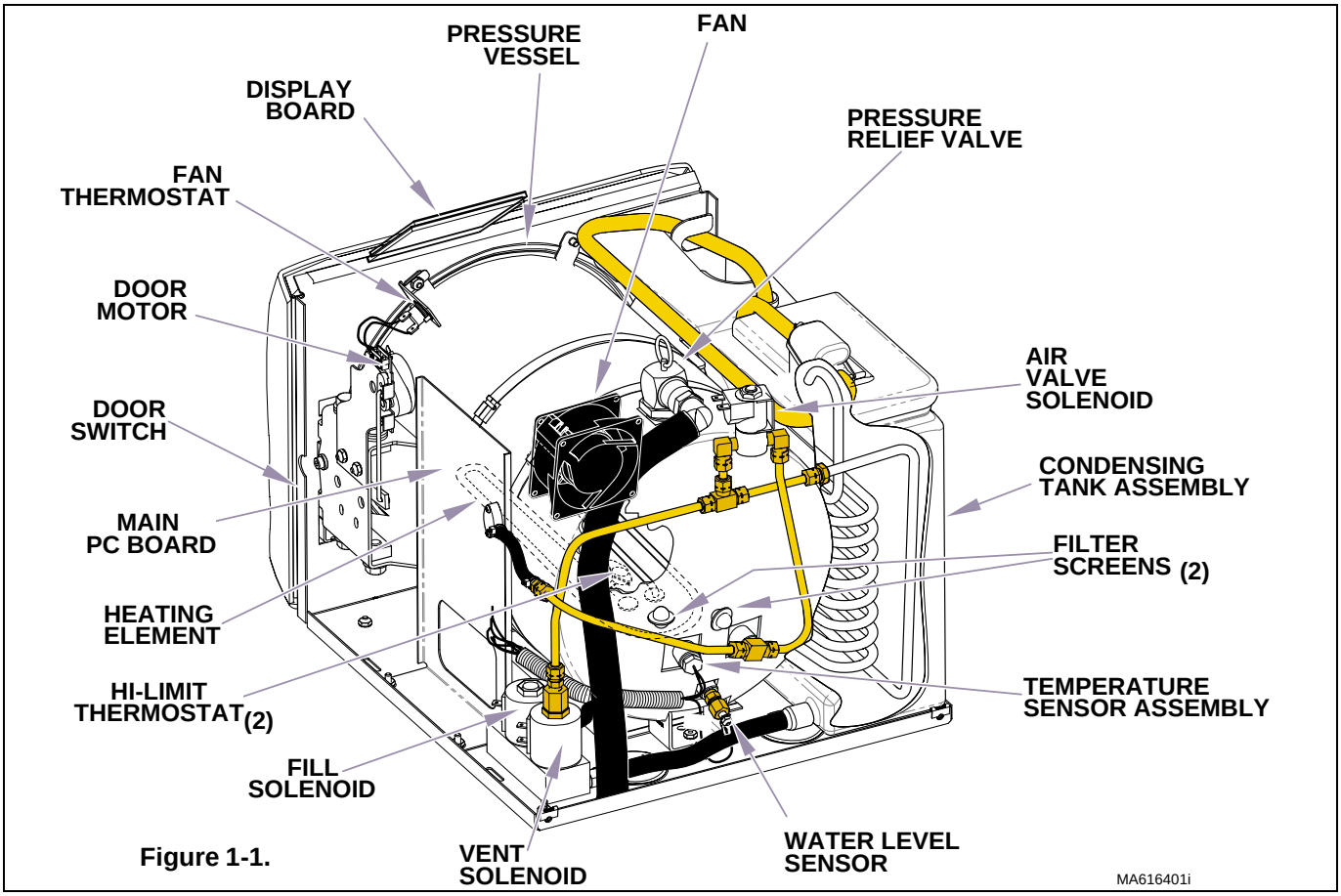

Figure 1-1.

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SECTION I
GENERAL INFORMATION

Air Valve
A Normally Closed Valve that, when energized open, removes air from chamber expelling it into the reservoir thru the condensing coil during operation. Controlled by main control p.c. board. Valve is located on top, back of pressure vessel.

Temperature Probe
Temperature probe monitors internal chamber temperature during operation and transmits it back to main p.c. board. The probe is located in the back of the chamber.

Main Control P.C. Board
Contains the program logic, and various connections to send and receive data to operate the various programs. SW1 dip switch assembly is located on the left side of the board. Service Diagnostics, and various display options can be accessed by changing switch positions. Fuses F1 and F2 protect the main control p.c. board.

Hi-Limit Switches
Controls power to heating elements and various components should overheat conditions exist.
Two normally closed, bimetal, thermostats that automatically opens contacts at 425°F (218°C) to 475°F (246°C) removing power to heating elements.
They automatically reset to the closed position at 325°F (163°C) to 375°F (191°C).
They are located on lower, outside surface of chamber.

Water Level Sensor
Located in back of chamber, it monitors the water level during the FILL cycle. When the water level reaches the sensor, a circuit is completed which signals the main control P.C. board to remove power from the Fill Valve solenoid, closing the valve.

Fill Valve
Fill Valve is a Normally Closed valve. *The Door Interlock switch must be closed to operate the Fill Valve.* When the START key is depressed the Fill Valve solenoid is energized. The valve opens, allowing water to enter the chamber. When water reaches the Water Level Sensor a circuit is completed, removing power from the Fill Valve solenoid coil, closing the valve.

Vent Valve
Vent Valve is a Normally Open valve controlled by the main control P.C. board. When K4 contacts on the Main P.C. Board close, the solenoid of the Vent Valve energizes, closing the valve. In the open position, the valve vents back thru the condensing coil in the reservoir.

Display / P.C. Board
Operation and Service Diagnostic messages are viewed though use of a liquid crystal display (LCD) on the front of the top cover.

Heating Element
Submersible, tubular, 1425 watt (115 VAC) or 1500 watt (230 VAC), heating element used to generate steam for the sterilizer.
During the Heatup, Sterilization and Dry cycles the temperature probe monitors internal chamber conditions, sending signals back to main control P.C. board which controls On / Off cycling of heater.

Pressure Relief Valve
The ASME approved Safety valve opens to vent the chamber should pressure inside chamber reach 40 PSIG [+/-2 PSI] (275.8 kPa). The steam is vented out below base of sterilizer.

Reservoir Tank w/ Condensing Coil
Retains supply of distilled water for operation. During a cycle air and steam is discharged from the chamber back thru the condensing coil into the reservoir. An equalizer tube, located on top of the reservoir, prevents pressure differential between the two chambers in the reservoir.

Filter Screens
Fine, stainless steel, mesh screens located in the back and bottom of chamber for filtering particles from the system. The Filters should be cleaned monthly or more often depending on use

Pressure Vessel
Includes chamber and door assembly which are ASME certified. Never attempt to make repairs on the pressure vessel.

Door and Dam Gaskets (Fig. 1-2)
Seals door when in latched position to prevent pressure from escaping around door during operation.

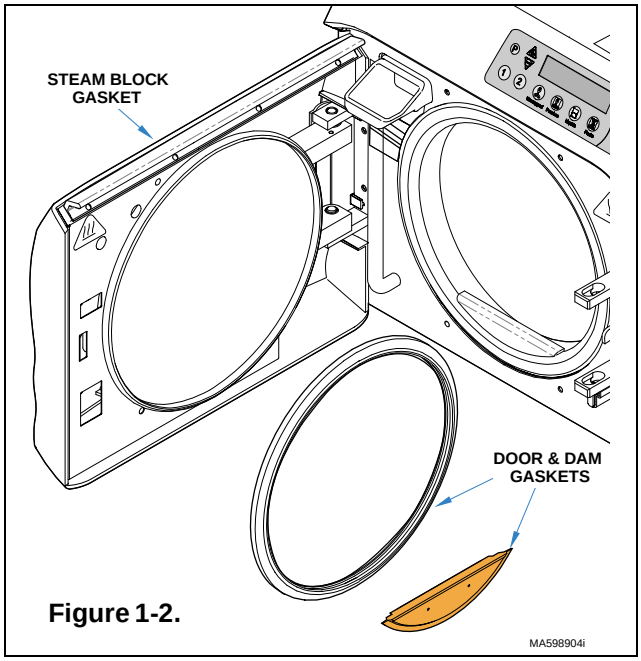

Figure 1-2.

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B. Theory of Normal Operation (115 or 230 VAC Units) (See Section 2 for Normal Operation Table 2-1 and Main Printed Circuit Board (PCB) and Component Layout, Figure 2-2)**.**

Power Up Mode: (Display: **INITIALIZING SYSTEM**)
• When the Power Cord is plugged into an outlet, line voltage is supplied to the Sterilizer's Main PCB to J5 connector.
• F1 and F2 fuses on the Main PCB protect the board's circuitry from excessive current draw. A transformer along with the voltage regulators on the PCB reduces line voltage to 5 & 12 VDC. The DC voltage provides power to operate the circuitry on the PCB, touchpads, and printer circuitry.
• Line voltage is also supplied from N / L2 of the plug outlet to one side of the Axial Flow Fan and from J5 (4) on the Main PCB to the Fan Thermostat.
The Fan Thermostat closes at 130°F(+/- 8°F) and opens at 101°F (+/- 6°F). If closed, power would be supplied to the other side of the Axial Fan Motor energizing it.
• During the Power Up Mode, the sterilizer executes an intialization upon all subsystems. In addition certain error conditions are also tested for, and the beginning messages are displayed (see Normal Operation Table 2-1).
• Power Up Mode ends when all systems have been initialized, or when an error condition is encountered.

Select Cycle Mode: (Display: **SELECT CYCLE**)
• When SELECT CYCLE is being displayed, before the user presses one of the cycle keys, the software opens the Air Valve for a maximum of 10 minutes or until the a Cycle is initiated by pressing the START key. This makes it easier to open the door.
Power is supplied thru J5 connector and the Normally Closed Hi Limit switches. The software has energized K5 relay, closing its contacts. Current is provided to terminals J6 and J7 and the Air Valve solenoid, opening the valve.

> **NOTE**
> To simplify explanation, the cycle chosen is UNWRAPPED. Basically, all cycles function the same. Time, temperature, and vent settings (slow or fast) could be different.

• During Select Cycle Mode, the user enters which sort of sterilization cycle that he would like to perform on the load (UNWRAPPED, POUCHES, PACKS, HANDPIECES, or programmable buttons 1 or 2).
• Select Cycle Mode ends when the user chooses a cycle-type, and presses the START button, or when an error condition occurs.
• "Additional Heat" feature *will be activated* if the START button is pressed before a cycle-type is selected.
K1 (Heater) contacts close. Current is supplied thru J5 connector, terminals 5 & 6, thru the two normally closed High Limit Switches and the closed contacts of K1 relay to terminals J3 & J4 on the PC board and to the Heating Element. The software will cycle the heating element on and off for five (5) seconds, once each minute for a period of 10 minutes.
• "Additional Heat" *will not activate* if one of the following occurred:
1. The Additional Heat feature has already been started once during the Select Cycle Mode.
2. The STOP button has been pressed prior to depressing the START button during Select Cycle.
3. Any of the cycle buttons have been pressed prior to pressing the START button during the Select Cycle.
• "Additional Heat", if enabled, will end and be disabled for the rest of this Select Cycle Mode for the following reasons:
1. Any of the cycle buttons have been pressed while in "Additional Heat".
2. The STOP button has been pressed prior to pressing the START button during Select Cycle.
3. Ten (10) minutes elapses, starting from the time that "Additional Heat" was enabled.

Fill Mode: (Display: **FILLING CHAMBER**)
• During Fill Mode water is allowed to run from the reservoir into the pressure vessel (chamber) by operation of a Fill Valve.
• After the software checks the system for errors it starts a 5 minute timer. The Main PCB supplies line voltage to the Fill Solenoid thru K2 (Fill Valve) contacts thru J5 connector, terminals 5 & 6, thru two normally closed High Limit Switches and the Door Interlock Switch (closed when door is closed) terminals J1 & J2 to terminals W3 & W4 on the Main PC board and to the Fill Valve, energizing it. The Heater is off. The Vent Valve is energized closed.
• Fill Mode ends when:
1. There is enough water in the chamber to activate the level sensor (J8 connector) sending a signal back to the Main PC board. (Display: **CHAMBER IS FULL**). K2 relay opens, closing the Fill Valve.
The Vent Valve remains closed (energized), the Air Valve remains open (energized), Heater is off.
2. An error condition occurs.
3. The user presses the STOP button.

Heat Up Mode: (Display: **HEATING - UNWRAPPED**)
• During the Heat Up Mode, steam temperature and pressure within the chamber are brought up to their set points chosen by the program button that was selected (UNWRAPPED in this example). This is done by energizing the Heating Element and manipulating the Air Valve to open and close, expelling air from the chamber.
• The Vent Valve (normally open) is energized to the closed position. Power is supplied thru K4 (Vent Valve) contacts thru J5 connector, terminals 5 & 6 thru the two normally closed High Limit Switches and to terminals W5 & W6 on the Main PC board to the Vent Valve energizing it (Closes).
• K1 (Heater) contacts are closed supplying line voltage thru J5 connector, terminals 5 & 6 thru the two normall

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SECTION I
GENERAL INFORMATION

closed High Limit Switches and to terminals J3 & J4 on the Main PC board and to the Heating Element energizing it.
• The Air Valve is closed until power is supplied thru K5 (Air Valve) contacts thru J5 connector, terminals 5 & 6 thru the two normally closed High Limit Switches and to terminals J6 & J7 on the Main PC board to the Air Valve energizing it (Opens).
• The operation of the Air Valve is controlled by the software of the Main PC board. The Temperature Probe (J12 connector) and the Pressure Transducer on the Main PCB monitor the conditions inside the chamber. During the Heat Up Mode the software will energize the Air Valve, opening it, to expel air from the chamber. This will occur three (3) times during the Heat Up Mode. Pressure at which the Air Valve opens (3.0 or 13.6 PSIg) and the amount of time (38 to 72 seconds) it is opened is controlled by the software.

Sterilization Mode: (Display: **STERILIZING**)
• During Sterilization Mode the steam temperature and pressure are maintained at their set points for a period of time (determined by cycle selected).
• This is done by monitoring the internal chamber temperature (Temperature Sensor, J12) and pressure (Pressure Transducer) and utilizing the software to manipulate (turning On & Off) the Heating Element.
• When the Heating Element is On, K1 (Heater) contacts are closed supplying line voltage thru J5 connector, terminals 5 & 6 thru the two normally closed High Limit Switches and to terminals J3 & J4 on the Main PCB to the Element.
• The Vent Valve (normally open) continues to be energized (Closed) during the Sterilizing Mode. Power is supplied thru K4 (Vent Valve) contacts thru J5 connector, terminals 5 & 6 thru the two normally closed High Limit Switches and to terminals W5 & W6 on the Main PCB to the Vent Valve energizing it (Closed).
• Final ten (10) seconds of Sterilization Mode **READY TO VENT** is displayed to indicate the system will be venting.

Vent Mode: (Display: **FAST VENT**)
• The Vent Valve is normally open when not energized. During the Vent Mode the pressure inside the chamber is evacuated and the temperature reduced by opening the vent valve (removing power from it) and turning off the heating element. The chamber is vented thru the condensing coil inside the reservoir.
• Fast Vent: On all pre-set cycle types such as UNWRAPPED. The Vent Valve is left opened until chamber has been completely evacuated.
• Slow Vent: Available on the two programmable (1&2) cycles. The Vent Valve is opened and closed at a rate of one (1) second open, 59 seconds closed until the chamber has been completely evacuated.
• To operate the Vent Valve power is supplied thru K4 (Vent Valve) contacts thru J5 connector, terminals 5 & 6 thru the two normally closed High Limit Switches and to terminals W5 & W6 on the Main PCB to the Vent Valve energizing it (Closed).
• The Temperature Sensor, J12, and pressure (Pressure Transducer) monitor the internal chamber conditions during the Vent Cycle.

Door Open Mode: (Displays: **DOOR TO OPEN** or **OPEN DOOR TO DRY**)
• The M9 & M11 use an automatic door opening feature. On M9D & M11D (defeatured) the door must be opened manually. The following explains the automatic feature.
• The Door Opening Motor Assembly consist of a synchronous motor and a normally closed *(when unoperated)* switch connected to J15 on the Main PCB.
• The Vent Valve is not energized, remaining Open.
• Power is applied to the Air Valve, opening it, from terminal 5 of connector J5 thru K5 (Air Valve) contacts thru the two normally closed High Limits switches to terminals J6 & J7 to the Air Valve.
• The Main PCB monitors the internal chamber pressure. When the pressure reaches 0.725 PSIg or lower K3 (Door) contacts close.
At the same time the Main PCB initiates a 35 second timer. This time lapse, until the unit displays DOOR TO OPEN or OPEN DOOR TO DRY, is to allow pressure in the chamber to settle to safe levels and to keep the door from opening too hard regardless if the unit has automatic or manual door opening.
• Power is supplied thru J5 connector, terminals 5 & 6 thru the two normally closed High Limit Switches and to connector J15, pins 1 & 3 on the Main PCB.
Though line voltage is always present on the white and black leads, the Switch contacts are being held open by the motor lever arm preventing the motor from operating.
• The Main PCB also supplies line voltage to pins 1 & 2 of J15 connector but only for 12 seconds. Current is supplied to the motor thru the white and red leads of the harness operating the motor.
• As the motor rotates, the motor lever arm disengages the switch. The switch contacts return to the Normally Closed position. This creates a second current path to the motor thru the white and black leads of the harness. As the motor shaft rotates, the attached linkage opens the door.
• When the motor lever arm contacts the stop on the motor mounting bracket the motor reverses directions, returning to the start position, opening the Normally Closed contacts on the switch and removing power from the motor. The motor assembly and linkage remains in its original position awaiting the next operation.

DRY Mode: (Displays: **DRY MODE**)
• During Dry Mode, the load inside the chamber is dried for a certain amount of time chosen when the preset or programmable button was selected.
• The Heater Element is turned On and Off by the Main PCB according to a preset (timed) duty cycle. • When the Heating Element is On, K1 (Heater) contacts are closed supplying line voltage thru J5 connector, terminals 5 & 6 thru the two normally closed High Limit Switches and to terminals J3 & J4 on the Main PCB to the Element.

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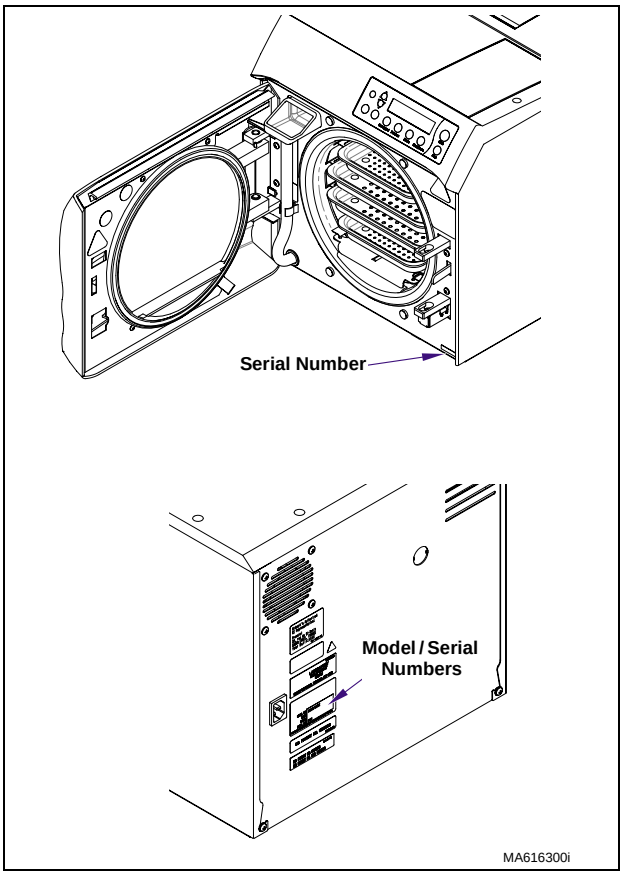
1.2 Model / Serial Number Location



1.3 Specifications

Factual data for the M9 & M11 Sterilizer is provided in Tables 1-1 & 1-2

M9 / M9D Sterilizer

Table 1-1. Specifications

Description	Data
Front Height (A, Fig.1-4)	15 13/16 in. (40.1 cm)
Width (B)	15 5/16 in. (38.9 cm)
Depth w/Plug (C)	20 1/8 in. (51.0 cm)
Back Height (D)	15 5/16 in. (39.1 cm)
Chamber Size:	Diameter 9 in. (22.9 cm) Depth 15 in. (38.1 cm)
Shipping Carton:	24.2 in."L" x 20.5 in."W" x 21 in."H" (66 cm x 54.6 cm x 52.8 cm)
Weight:	
With Reservoir Empty	73.0 lbs (33.1 kgs)
With Reservoir Full	82.0 lbs (37 kg)
Shipping weight	81 lbs (36.7 kgs)
Water Reservoir Capacity	Apprx. 1.1 gallon (4.1 Liters) to full mark

Electrical Requirements:

WARNING
Use 104 - 127 VAC, 50/60 HZ alternating current only for 115 VAC rated models and 207 - 253 VAC, 50/60 HZ alternating current only for 230 VAC rated models.

115 VAC Unit ..... 115 VAC, 50/60 HZ 15 amp, single phase
230 VAC Unit..... 230 VAC, 50/60 HZ 10 amp, single phase

Power Consumption:
115 VAC Unit ..... 1425 Watts, 12 amps @ 120 VAC
230 VAC Unit ..... 1500 Watts, 7 amps @ 240 VAC

M11 / M11D Sterilizer

Table 1-2. Specifications

Description	Data
Front Height (A, Fig.1-4)	17 13/16 in. (45.2 cm)
Width (B)	17 3/4 in. (45.2 cm)
Depth (C)	22 3/4 in. (57.8 cm)
Back Height (D)	17 5/8 in. (44.2 cm)
Chamber Size:	Diameter 11 in. (27.9 cm) Depth 18 in. (45.7 cm)
Shipping Carton:	26.2 in."L" x 21.5 in."W" x 21 in."H" (66.0 cm x 54.6 cm x 52.8 cm)
Weight:	
With Reservoir Empty	99.0 lbs (44.9 kgs)
With Reservoir Full	111.0 lbs (50.4 kgs)
Shipping weight	131.0 lbs (59.4 kgs)
Water Reservoir Capacity	Apprx. 1.4 gallon (5.3 Liters) to full mark

Electrical Requirements:

WARNING
Use 104 - 127 VAC, 50/60 HZ alternating current only for 115 VAC rated models and 207 - 253 VAC, 50/60 HZ alternating current only for 230 VAC rated models.

115 VAC Unit ..... 115 VAC, 50/60 HZ 12 amp, single phase
230 VAC Unit..... 230 VAC, 50/60 HZ 6.5 amp, single phase

Power Consumption:
115 VAC Unit ..... 1425 Watts, 12 amps @ 120 VAC
230 VAC Unit ..... 1500 Watts, 7 amps @240 VAC

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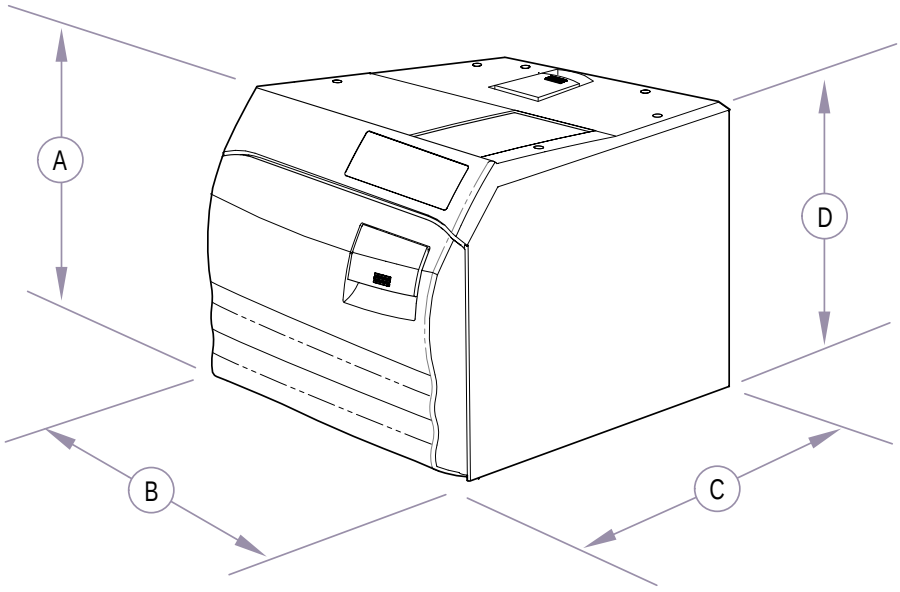
SECTION I
GENERAL INFORMATION



MA599600i

Figure 1-4.

M9 & M11 Sterilizers

Recommended Circuit:

A separate (dedicated) circuit is recommended for the sterilizer. Sterilizer *should not* be connected to an electrical circuit with other appliances or equipment unless circuit is rated for the additional load.

Chamber Pressure:

Operating.....27-31 psi (186-215 kPa)
Maximum Before Safety
Valve Opens ..... 40 PSI [+/- 2PSI] (275.8 kPa)

Chamber Temperature:

Operating.....230 - 275° F (110 - 135° C)

Certification: ASME Boiler & Pressure Vessel Code

UL61010A-1 c UL us LISTED LABORATORY EQUIPMENT 59FM

CLASSIFIED c UL us Medical Equipment UL61010A-1; UL61010A-2-041 59M Midmark Corporation

1.4 Ordering Parts

Contact Midmark's Technical Service Department with all necessary information (model / serial number, part number, quantity, etc.).

Orders can be placed using the Fax Order Form (page 7-2) or by calling the phone number on the back cover of this manual.

1.5 Special Tools

Table 1-3 lists all special tools needed to repair the sterilizer, how to obtain the tools, and purpose of each.

Table 1-3. Special Tool List

Description of Special Tool	Manufacturer	Manufacturer's Part Number	Purpose of Special Tool
Digital Multimeter w/ Amp Clamp (capable of displaying 3 digits)	Commercially Available	Any Type	For performing continuity, voltage, and current checks.
Digital Thermometer	Commercially Available	Any Type	Used to check temperatures in order to diagnose malfunctions.
Pressure Gauge Test Harness	Midmark Corporation 1-800 643-6275 Technical Service Dept.	002-0372-00	Used to check pressure in chamber during a cycle in order to diagnose malfunctions.

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SECTION II
TESTING AND TROUBLESHOOTING

2.1 Operational Test (See Figure 2-1)

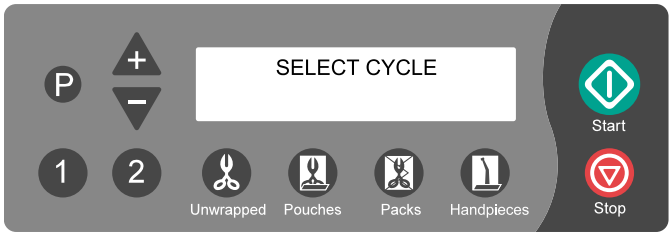

Figure 2-1. Display and Operator Control Pad

In order to effectively diagnose a malfunction of sterilizer, it may be necessary to perform an operational test as follows:

WARNING
Refer to Operator Manual for complete instructions on operating sterilizer. Failure to do so could result in personal injury.

NOTE
Operational Test, for most part, only describes what should happen when sterilizer is operated. If sterilizer does something other than described, a problem has been discovered. Refer to Troubleshooting Guide to determine cause of problem and its correction.

WARNING
Use 104 - 127 VAC, 50/60 HZ alternating current only for 115 VAC rated models and 207 - 253 VAC, 50/60 HZ alternating current only for 230 VAC rated models. Failure to do so could result in electrical shock to personnel and will result in damage to sterilizer.
Do not use this sterilizer in an explosive or oxygen-enriched atmosphere. Failure to do so could result in fatal or serious injury.

(1) Plug sterilizer power cord into a grounded, dedicated, correctly polarized outlet, that has proper voltage for sterilizer.

NOTE
Grounding reliability can only be achieved if unit is connected to a matching three-pronged, grounded, dedicated, correctly polarized outlet.

WARNING
Use 104 - 127 VAC, 50/60 HZ alternating current only for 115 VAC rated models and 207 - 253 VAC, 50/60 HZ alternating current only for 230 VAC rated models.

(2) **Electrical rating for 115 VAC Sterilizer:**
115 VAC, 50 / 60 Hz, 12 amps
Connect to a dedicated branch circuit rated for 115 VAC, 50 / 60 Hz, 15 amps minimum.
Electrical rating for 230 VAC Sterilizer:
230 VAC, 50 / 60 Hz, 6.5 amps
Connect to a dedicated branch circuit rated for 220 VAC, 50 / 60 Hz, 10 amps.
Check label on back panel to verify electrical specifications required for unit.

(3) Table 2-1, Operational Chart, describes a complete cycle during Normal operation, identifying audible signals, various display prompts and component operation.

(4) Display shows selected program's parameters when specific button is pressed.

Unwrapped — ***"UNWRAPPED 270°F 3 Minutes"***. ***"FAST VENT 30 MINUTE DRY"***.

Pouches — ***"POUCHES 270°F 5 Minutes". "FAST VENT 30 MINUTE DRY"***.

Packs — ***"PACKS 250°F 15 MINUTES" "FAST VENT 30 MINUTE DRY"***.

Handpieces — ***"HANDPIECES 270°F 6 MINUTES" "FAST VENT 30 MINUTE DRY"***.

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SECTION II
TESTING AND TROUBLESHOOTING

Normal Operation. Table 2-1.

Unit Plugged Into Outlet

Audible	Display	Action / Notes
Audible beeps	**INITIALIZING SYSTEM**	**Note:** The fan may run if the temperature inside cabinet is 130°F (+/- 8°F) (54°C) or greater.
	TOTAL CYCLES XXXX M9*, vX.XX	Total number of cycles that have been run on Sterilizer. Model Number* system is set up for and Software version number. ** (System can be set for M9, M9D, M11, or M11D using SW1 switch 2)*
	SELECT CYCLE	• **Fill Valve** - Closed • **Vent Valve** - Open • **Air Valve** - Energized - Open for 10 min. or until Cycle started • **Heater** - Off

Press Cycle Key (i.e.: UNWRAPPED)

Audible	Display	Action / Notes
	UNWRAPPED 270° F 3:00 MINUTES	The sterilization program, temperature, time period, type of venting and dry cycle time is displayed. • **Fill Valve** - Closed • **Vent Valve** - Open • **Air Valve** - Energized - Open for 10 min. or until Cycle started • **Heater** - Off
	FAST VENT 30 MINUTE DRY	

Press START Key

Audible	Display	Action / Notes
Audible beeps	**FILLING CHAMBER**	• **Fill Valve** - Energized - Open • **Vent Valve** - Energized - Closed • **Air Valve** - Close momentarily then Energized - Open • **Heater** - Off
	CHAMBER IS FULL	Water reaches level of Water Level Sensor sending signal back to main P.C. board. • **Fill Valve** - Closed • **Vent Valve** - Energized - Closed • **Air Valve** - Energized - Open • **Heater** - Off
	HEATING - UNWRAPPED XXX °F XX.X PSI (temp.) (pressure)* *See Action/Notes	• **Fill Valve** - Closed • **Vent Valve** - Energized - Closed • **Air Valve** - Initially Closed - Energizes Open* • **Heater** - On ** Air Valve will open 3 times at apprx. 1/2 (3.0 or 13.6 PSIg) of the Sterization pressure. It will close between 38 to 72 secs. dependent on the model (M9 / M11) & the Cycle selected (Unwrapped, Packs, etc.). Temperature will vary.*
	STERILIZING 03:00 270 °F 27.1 PSI (time) (temp.) (pressure)	Displayed sterilization time begins to count down. • **Fill Valve** - Closed • **Vent Valve** - Energized - Closed • **Air Valve** - Closed • **Heater** - Cycles On & Off.
	READY TO VENT 00:10 270 °F 27.1 PSI (time) (temp.) (pressure)	In *final 10 seconds* of Sterilizing Mode "READY TO VENT" blinks on & off in display. • **Fill Valve** - Closed • **Vent Valve** - Energized - Closed • **Air Valve** - Closed • **Heater** - Cycles On & Off.
	FAST VENT XXX °F XX.X PSI (temp.) (pressure)	Chamber vents into reservoir. • **Fill Valve** - Closed • **Vent Valve** - Open • **Air Valve** - Closed • **Heater** - Off.
Audible beeps (Occurs 5 seconds before Door opens.)	**DOOR TO OPEN XXX °F 00.725 PSI** (temp.) (pressure)	When pressure in chamber reaches **.7 PSIg** (5 kPag) "DOOR TO OPEN" blinks on & off in display while 35 seconds elapses. • **Fill Valve** - Closed • **Vent Valve** - Open • **Air Valve** - Open • **Heater** - Off. • **Door Opening Motor** - Energizes (after 35 sec. delay), rotating the motor lever arm, unlatching the door. *Door opens to partially open position.* Motor automatically reverses back to original position.
	DRYING 30:00 (time)	Displayed drying time begins to count down. • **Fill Valve** - Closed • **Vent Valve** - Open • **Air Valve** - Closed • **Heater** - Cycles On & Off
Audible beeps for 10 seconds	**DRY CYCLE COMPLETE**	• **Fill Valve** - Closed • **Vent Valve** - Open • **Air Valve** - Closed • **Heater** - Off.
	SELECT CYCLE	Unit is ready for another operation. • **Fill Valve** - Closed • **Vent Valve** - Open • **Air Valve** - Energized - Open for 10 min. or until Cycle started • **Heater** - Off

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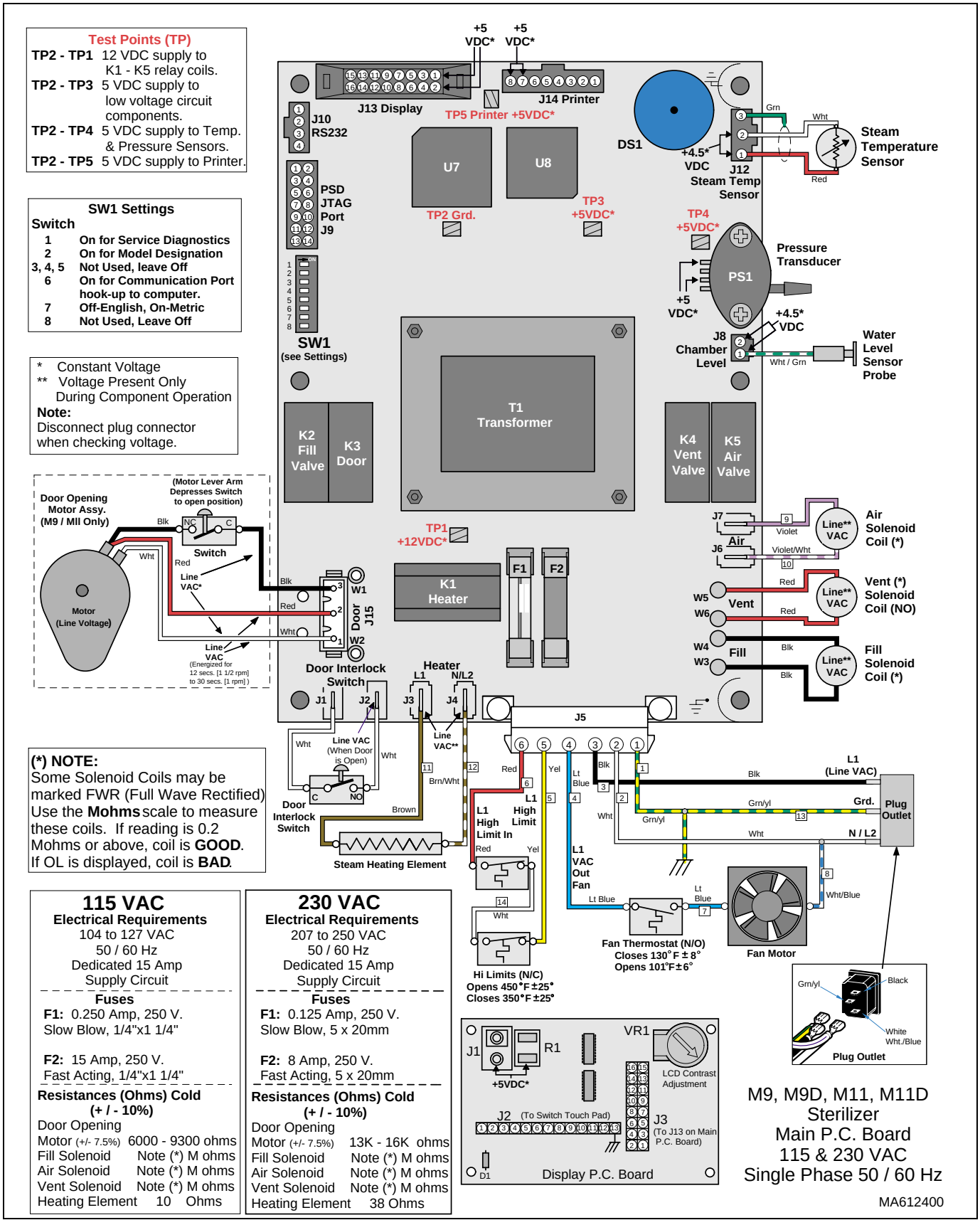

Figure 2-2. Schematic

2.2 Service Diagnostics

EQUIPMENT ALERT
Always complete *Service Diagnostics* before replacing any major components especially the Main P.C. Board.

Service Diagnostics allows testing the various components of the sterilizer through use of operator buttons, and the display.

WARNING
Unplug unit from electrical outlet to prevent possibility of personal injury or death from electrical shock.

To Initiate Service Diagnostics:

(1) Unplug unit from electrical outlet.

(2) Remove panels (Refer to para 4-2).

(3) Place SW1 Switch 1 (Figure 2-3) in *ON* (right) position.

WARNING
Use extreme caution when unit is plugged into outlet to prevent possibility of personal injury from electrical shock.

(4) Plug unit into outlet.

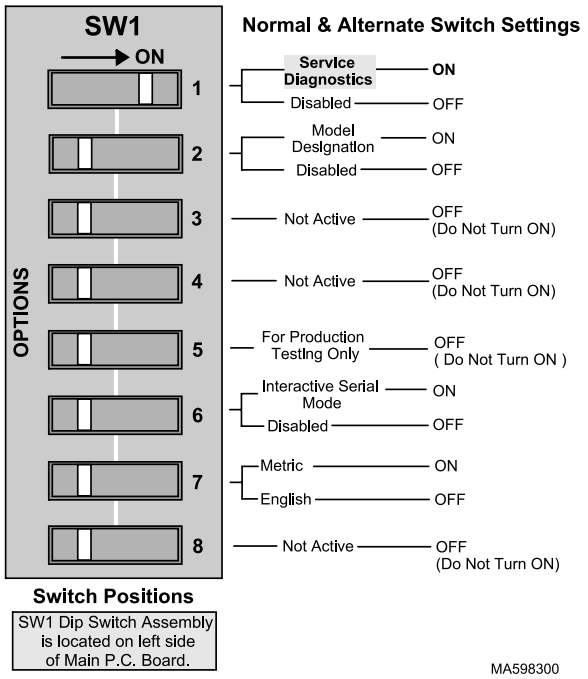

Fig. 2-3. SW1 Dip Switch

(5) Use Table 2-2 to perform the Service Diagnostics.

Service Diagnostics. Table 2-2.

Plug Unit Into Outlet	
Display	**Action / Notes**
INITIALIZING SYSTEM	•Total number of cycles that have been ran on unit. •Model Number (M9, M9D, M11, or M11D) * Model designation is set using SW1 switch 2. •Software version number.
TOTAL CYCLES XX **M9*, vX.XX**	
SERVICE DIAGNOSTICS **< START > TO CONTINUE**	

Press START	
Display	**Action / Notes**
< START > I / O TEST **< STOP > RECALL ERRORS** **< HANDPIECES > KEYTEST**	Press START to go to I/O Test Press STOP to display last 5 error codes. Press HANDPIECES to run Key Test.

Press START	
Display	**Action / Notes**
AIR VALVE TEST **< START > TO TOGGLE** **< STOP > FOR NEXT TEST**	Pressing START energizes Air Valve solenoid coil, opening the valve.

Press STOP	
Display	**Action / Notes**
VENT VALVE TEST **< START > TO TOGGLE** **< STOP > FOR NEXT TEST**	Pressing START energizes Vent Valve solenoid coil, closing the N/O valve.

Press STOP	
Display	**Action / Notes**
FILL VALVE TEST **< START > TO TOGGLE** **< STOP > FOR NEXT TEST**	Pressing START opens Fill Valve. *(Door must be closed)* Water flows into chamber. **NOTE:** Water Level Probe does not function. *Water can overflow* from chamber unless START button is pressed again or STOP is pressed to terminated test.

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Press STOP

Display	Action / Notes
DOOR OPEN TEST* < START > TO TOGGLE < STOP > FOR NEXT TEST	Pressing START energizes Door Opening Motor. Door goes to partially open position. *Does not appear on "D" (defeatured) Model units.

Press STOP

Display	Action / Notes
STEAM HEATER TEST < START > TO TOGGLE < STOP > FOR NEXT TEST	Pressing START energizes Steam Heater coil. Heater will automatically shut-off after 15 seconds. Run only 2 cycles to prevent over-heating. Allow unit to cool

Press STOP

Display	Action / Notes
< STOP > FOR NEXT TEST HI-LIM DOOR FILL CLOSED OPEN EMPTY	Shows conditions of High Limit Switch (Open or Closed). Door Interlock Switch (Open or Closed). Water Level Sensor (Empty or Full).

Press STOP

Display	Action / Notes
< STOP > FOR NEXT TEST XX.X°F XX.XPSI	Displays chamber temperature and pressure.

Press STOP

Display	Action / Notes
< START > I / O TEST < STOP > RECALL ERRORS < PACKS > KEYPAD TEST	

Press STOP

Display	Action / Notes
< START > TO ZERO < STOP > FOR NEXT TEST ERROR: 1: CXXX 2: CXXX 3: CXXX 4: CXXX 5: CXXX ***NOTE*** *If a **C099** Code is denoted in the error codes ignore it. It was generated at the factory and nothing is wrong.*	Last 5 error codes displayed. Number 1 is the most recent code. Pressing START erases displayed codes. Pressing STOP retains codes.

Press STOP

Display	Action / Notes
< STOP > FOR NEXT TEST XX.X°F XX.XPSI	Displays chamber temperature and pressure.

Press STOP

Display	Action / Notes
< START > I / O TEST < STOP > RECALL ERRORS < HANDPIECES > KEYTEST	

Press HANDPIECES (Handpieces)

Display	Action / Notes
PRESS < START > TO TEST KEY INPUT	When START button is depress an audible signal is heard to verify input of key. Diagnostic Mode automatically advances to the *next* key to be tested.

After all key inputs have been tested, display advances to:

Display	Action / Notes
< STOP > FOR NEXT TEST XX.X°F XX.XPSI	Displays chamber temperature and pressure.

Service Diagnostics is complete.

(1) Unplug unit from electrical outlet.

(2) Place dip switch 1 (Figure 2-3) in *OFF* (left) position for Normal Operation.

(3) Install panels and plug unit back into the outlet.

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2.3 Areas to Check For Pressure Leaks

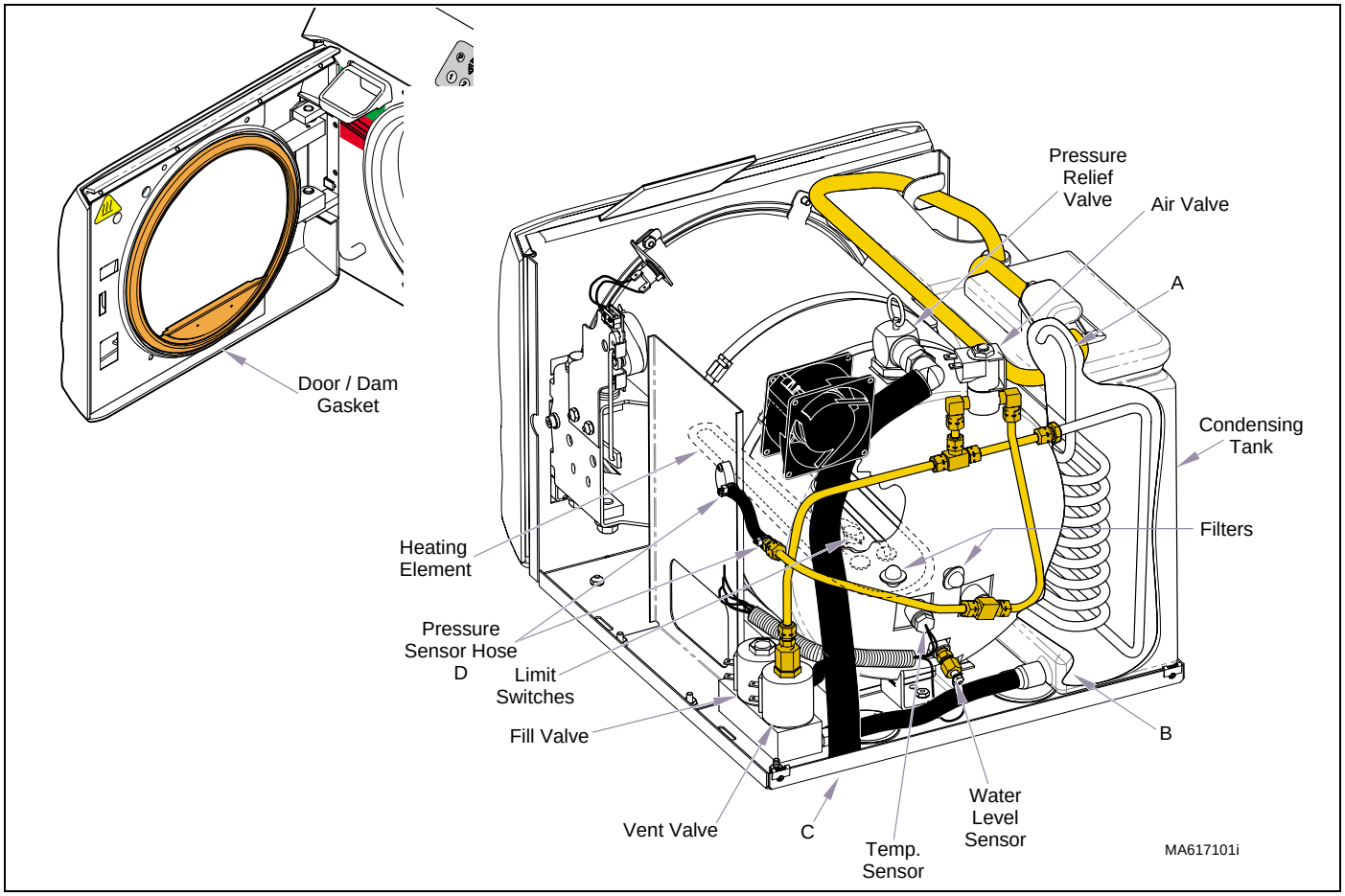

Table 2-4. Areas To Check For Pressure Leaks

Component	Check	Correction
Door Gasket	Check for water leaking around door.	Clean or replace door gasket (Refer to para. 4.8).
Vent Valve	Check for water leaking from outlet of condensing coil (A).	Clean or replace vent valve. (Refer to para. 4.18).
Fill Valve	Check for water leaking back into reservoir thru fill line (B), raising reservoir water level or bubbles coming from bottom of reservoir.	Clean or replace fill valve. (Refer to para. 4.18).
Air Valve	Check for excessive steam exhausting from outlet of condensing coil (A). NOTE: During the HEAT& VENT modes steam will be exhausted from the condensing coil (A).	Clean or replace Air Valve (Refer to para. 4.15).
Pressure Relief Valve	Check for water or steam leakage beneath back (C) of sterilizer from pressure relief valve.	Replace Pressure Relief Valve (Refer to para. 4.17). **NOTE:** Run a Pressure Relief Valve Test (para. 4.16) before replacing valve.
Pressure Sensor Hose	Check for steam leakage onto Main PC Board where Pressure Sensor Hose connects (D) to Pressure Transducer.	Secure pressure sensor hose to pressure transducer with high temperature cable tie.
Water Level Sensor	Check for leakage at the Water Level Sensor.	Repair or replace the Water Level Sensor (Refer to para 4.22).
Heating Element	Check for leakage at bottom of chamber around heating element connections.	Repair or replace heating element gaskets (Refer to para 4.21).
Various Fittings & Connections	During Sterilization mode when the chamber produces the highest pressures, check the various fittings for leakage.	Tighten or repair the fitting(s).

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2.4 Troubleshooting Procedures

Table 2-5 is a Troubleshooting Guide which is used to help to determine the cause of a malfunction.

Refer to Section V Schematics and Diagrams for tracing circuits and referencing points in Troubleshooting Guide.

Error Categories (Severity)

There are 3 categories of errors in the M9 / M11 software:

Automatic Errors:

• Minor problem causing Operator to do something such as close the door, etc.
Once cleared the sterilizer continues on where it left off.

Restart Errors:

• Possible problems with M9 / M11 control system or with producing an effective sterilization cycle.

• May be due to something Operator did such as pressing STOP button during a sterilization mode.

• Could also be due to temperature values being outside normal range required as sensed by temperature probe.

Operator is prompted to press *STOP* button, **abandoning the sterilization cycle.**

Pressing the STOP button will stop the audible signal but *60+ seconds must pass* since the condition was indicated and the pressure inside the chamber must be equal to or below 0.7 PSIg (5 Kpa) before it returns to SELECT CYCLE MODE to allow starting another cycle.

Fatal Errors:

• This would indicate possible serious problems with the M9 / M11 control system.

Pressing the *STOP* button before 60 seconds (when it turns off automatically) will silence the audible signal but the Power must be disconnected to clear the error code display.

Unit should not be run until a trained Service Technician has repaired the malfunction.

NOTE
In the Troubleshooting Guide, Table 2-3, the Type of Error Category of the specific Code will be included on the chart.

EQUIPMENT ALERT
Always complete Service Diagnostics (Section 2.2) before replacing any major components, *especially the Main P.C. Control Board.*

WARNING
Use extreme caution when testing components with unit plugged into outlet. Line voltage is present.

ERROR CODES

Digit	First Digit = SYSTEM*	Second Digit = SYMPTOM**	Third Digit = MODE***
0	General System (0)	*(blank) (0)*	Power Up (0)
1	Stop Key (1)	Power Loss (1)	Select (1)
2	Water Fill Sensor (2)	Closed (2)	Fill (2)
3	Door Latch Sensor (3)	Low (3)	Heatup (3)
4		High (4)	Sterilization (4)
5	Steam Temp. Sensor (5)		Vent (5)
6	Pressure Sensor (6)	Hardware (6)	Door Open (6)
7		Over Limit (7)	Dry (7)
8		Open (8)	
9	High Limit (9)		

Example:
C987
C = Code
9 = Hi Limit
8 = Open
7 = Dry Mode

***SYSTEM:** Designates which input system caught the error. (General System [0], Pressure Sensor [6], High Limit [9], etc.)

****SYMPTOM:** Represents the error's symptom. (Power Loss [1}, Over Limit [7], Open [8], etc.)

*****MODE:** Mode that the error occurred in. (Select [1], Heatup [3], Vent [5], etc.)

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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
(Non-Coded Errors) **Sterilizer has no power.**	When depressed Touch-pad or Display do not work.	Sterilizer is not plugged in.	Check that power cord is plugged into sterilizer and/or outlet.	Plug power cord into sterilizer and/or outlet.
		No power at outlet	Check for voltage at outlet.	Reset circuit breaker. Assure outlet is on dedicated circuit capable of handling sterilizer power requirements.
Touch pad and display do not work. Sterilizer has power.	There is no display and touch pad does not work.	Fuses F1 and F2 on Main P.C. board are blown or open.	Check continuity of fuses F1 and F2 with Ohm meter.	Replace fuses with same style and rating.
		Ribbon cable from J13 on Main P.C. board to J3 on Display P.C. board is disconnected.	Check plug connectors of J13 on Main P.C. board and J3 on Display P.C. board.	Assure printer ribbon cable connectors are plugged in securely
		J13 / J3 ribbon cable has open lead(s).	Check continuity of J13/ J3 ribbon cable.	Replace ribbon cable.
		Main P.C. Board is malfunctioning.	Check for 5 VDC between Test Points, TP2 & TP3 and on pin connector J13 across pins 1 & 2, (see Main P.C. Board diagram).	If voltage is 5 VDC is not present at these points replace Main P.C Board (Refer to para 4.13).
		Display P.C. Board is malfunctioning.	Check for 5 VDC betweeen R1and J1 on Display P.C. Board (see Main P.C. Board diagram).	If no 5 VDC is present replace Display P.C. Board (Refer to para 4.3).
No Display Touch pads work. Sterilizer has power.	Displayed data is a line of undefined characters and intermitent beep continues.	Ribbon cable from J2 to touch pad is disconnected	Check J2 Plug connection.	Assure J2 Plug pins are aligned and connected securely.
		J2 ribbon cable to touch pad has open lead(s).	Check continuity of J2 ribbon cable and touch pad.	Replace touch pad and ribbon cable assembly (Refer to para 4.2).
(Coded Errors) **Code C010.** (Error Type: *RESTART*)	**C010: POWER UP MODE SYSTEM PWR LOSS** **ITEMS NOT STERILE PUSH STOP TO RESTART** Unit lost power for a few seconds during Fill, Heat Up, or Sterilization Mode.	Power interruption.	Check voltage supply to assure outlet is on a dedicated circuit with correct circuit breaker or fuse.	Plug unit into a dedicated circuit with correct circuit breaker or fuse. (Refer to Schematic, Figure 2-2). Power interruption could be due to an electrical storm, brown out, etc.
Code C060. (Error Type: *FATAL*)	**C060: POWER UP MODE SYSTEM HARDWARE** **ITEMS NOT STERILE UNPLUG/RE-PLUG UNIT** Also, if an error that occurred in one of these modes was not properly cleared before unit was Unplugged and Replugged in to power source.	May be an internal glitch due to a brief interruption of power with components on P.C. Board (RAM, A/DC).	Check voltage supply to assure outlet is on a dedicated circuit with correct circuit breaker or fuse.	Plug unit into a dedicated circuit with correct circuit breaker or fuse. (Refer to Schematic, Figure 2-2). Power interruption could be due to an electrical storm, etc.
Code C099	**C099 MISC. MODE ??? ???** **PUSH STOP TO RESTART**	Code was generated at the factory during testing when an external device such as a PC or laptop was connected to the Sterilizer main PC board.	No Check Necessary	None. Ignore code.

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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Code C102 FILL **Code C103 HEATUP** **Code C104 STERILIZE** **Code C105 VENT** **Code C106 DOOR OPEN** (Error Type: *RESTART*)	*(Refer to column on left for codes and description)* **C10X: XXXXXX MODE STOP PRESSED** **ITEMS NOT STERILE PUSH STOP TO RESTART**	Operator pressed STOP button, terminating that specific Mode.	Check with person operating unit.	Explain proper operation. **Note:** It may be necessary to wait briefly (up to 1 minute) while chamber pressure / temperature dissipates. Press STOP button to return to SELECT CYCLE to initiate a new cycle.
Code C232. (Error Type: *RESTART*)	**C232: FILL MODE WATER LOW** **ITEMS NOT STERILE PUSH STOP TO RESTART** After door is closed or chamber vented, water fill (level) sensor did not detect water level within the 5 minutes required time period.	Reservoir water level low.	Check water level in Reservoir.	Add water to reservoir so that it is in the correct range on the water level label. Push STOP to restart back to SELECT CYCLE Mode.
		Mesh filter restricted.	Check if mesh filter is clogged.	Clean or replace mesh filter.
		Water Fill (level) Sensor dirty.	Check Water Fill (level) Sensor for dirt or corrosion.	Clean or replace Water Fill (level) Sensor (Refer to para 4.21).
		Fill Valve or related plumbing clogged.	Check Water Fill Valve and related tubing for restrictions.	Clean or replace Water Fill Valve (Refer to para 4.18).
		Fill Valve coil malfunctioning.	Check continuity of Water Fill Valve solenoid coil for open winding.	Replace Water Fill Valve (Refer to para 4.18).
		Plug connection(s) W3 / W4 loose or disconnected or broken wires.	Check Water Fill Valve connections at W3 / W4 on P.C. Board and related leads.	Assure W3 / W4 plug connections are securely connected and related leads are not broken.
		P.C. board malfunctioning	Check for line (115 or 230 VAC) voltage at W3 / W4.	If no voltage replace P.C. Board (Refer to para 4.13). Always run Service Diagnostics (Para 2.2) before replacing P.C. Board.
			Check for 4.5 to 5.0 VDC at J8 pins 1 & 2 on P.C. Board. Run a Service Diagnostics to check functions of Fill Valve and related components	If no voltage replace P.C. Board (Refer to para 4.13). Always run Service Diagnostics (Para 2.2) before replacing P.C. Board.
Code C326. (Error Type: *AUTOMATIC*)	**C326: DOOR MODE DOOR CLOSED** **OPEN DOOR** Door remains closed one second after door opening motor output was turned from On to Off in an attempt to open door.	Door may be hanging up on door opening motor latch.	Check position of door (open or closed). Run Service Diagnostics and run Door Opening Test.	Run another cycle. If condition persist where door must be manually opened check door opening assembly for adjustment or replace assembly (Refer to para 4.12).
		Door Switch malfunctioning.	Check Door Switch contacts to assure they close when door is closed and open when door is opened.	If contact of Door Switch shows open when door is closed replace switch (Refer to para 4.11).

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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Code C326. (Continued) (Error Type: *AUTOMATIC*)	**C326: DOOR MODE** **DOOR CLOSED** **OPEN DOOR** Door is Open but Code C326 is displayed.	P.C. Board malfunctioning.	Disconnect Door Interlock Switch leads from J1 & J2 then check for line (115 or 230 VAC) voltage at J1 & J2.	If no voltage is present and problem persist replace P.C. Board (Refer to para 4-13). **Always** run Service Diagnostics (Para 2.2) before replacing P.C. Board.
Code C382 FILL (Error Type: *AUTOMATIC*) **Code C383 HEATUP** (Error Type: *RESTART*)	*(Refer to column on left for codes and description)* **C38X: XXXXXX MODE** **DOOR OPEN** **ITEMS NOT STERILE** **CLOSE DOOR**	Door Switch contacts opened during Fill Mode.	Check with person operating unit to see if door was opened as unit was filling.	Explain proper operation. Close door, cycle will continue where left off.
			Check Door Switch. Contact should be closed when door is in closed position.	If contact of Door Switch shows open when door is closed replace switch (Refer to para 4.11).
Code C384. (Error Type: *FATAL*)	**C384: STERILIZE MODE** **DOOR OPEN** **ITEMS NOT STERILE** **UNPLUG / RE-PLUG UNIT**	Door Switch contacts opened during Sterilize Mode.	Check Door Switch. Contact should be closed when door is in closed position.	If contact of Door Switch shows open when door is closed replace switch (Refer to para 4.11).
Code C533. (Error Type: *FATAL*)	**C533: HEATUP MODE** **STEAM TEMP LOW** **ITEMS NOT STERILE** **UNPLUG / RE-PLUG UNIT** Sterilization Mode not reached by 25 minutes.	Steam Heater malfunctioning.	Check Steam Heater resistance and for grounding. 115 VAC = 10 Ohms* 230 VAC = 38 Ohms* *(+/- 10% cold reading)*	If Steam heater shows open or short replace heater (Refer to para 4.20).
		Steam leakage from chamber.	Check door gasket, all fittings and valves for leakage.	Repair or replace leaking component(s).
		Temperature Sensor (RTD) is malfunctioning.	Place a calibrated temperature probe inside chamber & run Service Diagnostics and check temp. readings.	If STEAM temperature reading is not in line with temperature probe reading replace Temperature Sensor (Refer to para 4.10).
		Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4. Remove plug connector at J12 on P.C. Board and check voltage on pins 1 & 2. Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C534. (Error Type: *FATAL*)	**C534: STERILIZE MODE** **STEAM TEMP LOW** **ITEMS NOT STERILE** **UNPLUG / RE-PLUG UNIT** During the Sterilization Mode of the particular cycle, the chamber temp. drops below the cycle's designated sterilization temp.	Steam Heater malfunctioning.	Check Steam Heater resistance and for grounding. 115 VAC = 10 Ohms* 230 VAC = 38 Ohms* *(+/- 10% cold reading)*	If Steam heater shows open or short replace heater (Refer to para 4.20).

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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Code C534. (Continued) (Error Type: *FATAL*)	(Continued) **C534: STERILIZE MODE STEAM TEMP LOW** **ITEMS NOT STERILE UNPLUG / RE-PLUG UNIT** During the Sterilization Mode of the particular cycle, the chamber temp. drops below the cycle's designated sterilization temp.	Steam leakage from chamber.	Check door gasket, all fittings and valves for leakage.	Repair or replace leaking component(s).
		Steam Temperature sensor (RTD) is malfunctioning.	Remove plug connector at J12 on P.C. Board and check resistance value (ohms) of RTD between white and red leads. Resistance values should be between the following: 75°F (23°C) = 1090 ohms. 545°F (285°C) = 2066 ohms. *Above values +/- 10 Ohms*	If Steam Temperature probe shows open or values outside resistance ranges replace probe (Refer to para 4.10).
		Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4. Remove plug connector at J12 on P.C. Board and check voltage on pins 1 & 2. Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C544. (Error Type: *FATAL*)	**C544: STERILIZE MODE STEAM TEMP HIGH** **ITEMS NOT STERILE UNPLUG / RE-PLUG UNIT** During the Sterilization Mode of the particular cycle, the chamber temp. increases (+6°F) above the cycle's designated sterilization temp.	Water dissipated or leaked out thru Vent or Fill Valve causing temperature in chamber to fluctuate over Sterilization temperature.	Check condition of Vent and Fill Valves to assure they are not leaking thru valve.	Replace malfunctioning valve if required. Refer to para 4.18.
		Steam Temperature sensor (RTD) is malfunctioning.	Remove plug connector at J12 on P.C. Board and check resistance value (ohms) of RTD between white and red leads. Resistance values should be between the following: 75°F (23°C) = 1090 ohms. 545°F (285°C) = 2066 ohms. *Above values +/- 10 Ohms*	If Steam Temperature probe shows open or values outside resistance ranges replace probe (Refer to para 4.10).
		Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4. Remove plug connector at J12 on P.C. Board and check voltage on pins 1 & 2. Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).

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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Code C560. (Error Type: *FATAL*) **Note**: When a Code ends in "0" it means unit had a supply power interruption. The operator could have unplugged the unit when a previous Code was displayed. *Always go to Service Diagnostics and check previous 5 codes that are displayed.*	**C560: POWER UP MODE STEAM TEMP HARDWARE** **UNPLUG / RE-PLUG UNIT** Steam A / D converter reports an average value outside the limits for normal operation during POWER UP mode.	May be due to a malfunction that occurred previously to Code displayed.	Go to Service Diagnostics and check previous 5 displayed codes.	Refer to Code Numbers in Troubleshooting Guide to determine correction.
		Steam Temperature Sensor (RTD) unplugged from P.C. Board at J12 pin connector.	Check condition of Steam RTD plug on P.C. Board. (Refer to P.C. Board Schematic in Section 5).	Assure Steam RTD plug connector is secure.
		Steam Temperature Sensor (RTD) malfunctioning.	Remove plug connector at J12 on P.C. Board and check resistance value (ohms) of RTD between white and red leads. Resistance values should be between the following: 75°F (23°C) = 1090 ohms. 545°F (285°C) = 2066 ohms. *Above values +/- 10 Ohms*	If Steam Temperature probe shows open or values outside resistance ranges replace probe (Refer to para 4.10).
		Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4. Remove plug connector at J12 on P.C. Board and check voltage on pins 1 & 2. Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C561 SELECT **Code C562 FILL** **Code C563 HEATUP** **Code C564 STERILIZE** **Code C565 VENT** **Code C567 DRY** (Error Type: *FATAL*)	*(Refer to column on left for codes and description)* **C56X: XXXXXX MODE STEAM TEMP HARDWARE** **UNPLUG / RE-PLUG UNIT** Steam A / D converter reports an average value outside the limits for normal operation during specific mode.	Steam Temperature Sensor (RTD) unplugged from P.C. Board at J12 pin connector.	Check condition of Steam RTD plug on P.C. Board. (Refer to P.C. Board Schematic in Section 5).	Assure Steam RTD plug connector is secure.
		Steam Temperature Sensor (RTD), malfunctioning.	Remove plug connector at J12 on P.C. Board and check resistance value (ohms) of RTD between white and red leads. Resistance values should be between the following: 75°F (23°C) = 1090 ohms. 545°F (285°C) = 2066 ohms. *Above values +/- 10 Ohms*	If Steam Temperature probe shows open or values outside resistance ranges replace probe (Refer to para 4.10).
		Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4. Remove plug connector at J12 on P.C. Board and check voltage on pins 1 & 2. Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).

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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Code C570. (Error Type: *FATAL*) **Note**: When a Code ends in "0" it means unit had a supply power interruption. The operator could have unplugged the unit when a previous Code was displayed. *Always go to Service Diagnostics and check previous 5 codes that are displayed.*	**C570: POWER UP MODE STEAM TEMP OVERLIM** **UNPLUG / RE-PLUG UNIT** Steam temperature exceeds 284°F (140°C) during POWER UP mode.	May be due to a malfunction that occurred previously to Code displayed.	Go to Service Diagnostics and check previous 5 displayed codes.	Refer to Code Numbers in Troubleshooting Guide to determine correction.
		Steam Temperature Sensor (RTD) malfunctioning.	Remove plug connector at J12 on P.C. Board and check resistance value (ohms) of RTD between white and red leads. Resistance values should be between the following: 75°F (23°C) = 1090 ohms. 545°F (285°C) = 2066 ohms. *Above values +/- 10 Ohms*	If Steam Temperature probe shows open or values outside resistance ranges replace probe (Refer to para 4.10).
		Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4. Remove plug connector at J12 on P.C. Board and check voltage on pins 1 & 2. Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C571 SELECT **Code C572 FILL** (Error Type: *FATAL*)	*(Refer to column on left for codes and description)* **C571: SELECT MODE STEAM TEMP OVERLIM** **UNPLUG / RE-PLUG UNIT** Steam temperature exceeds 284°F (140°C) during specific mode.	Steam Temperature Sensor (RTD) malfunctioning.	Remove plug connector at J12 on P.C. Board and check resistance value (ohms) of RTD between white and red leads. Resistance values should be between the following: 75°F (23°C) = 1090 ohms. 545°F (285°C) = 2066 ohms. *Above values +/- 10 Ohms*	If Steam Temperature probe shows open or values outside resistance ranges replace probe (Refer to para 4.10).
		Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4. Remove plug connector at J12 on P.C. Board and check voltage on pins 1 & 2. Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C573. (Error Type: *FATAL*)	**C573: HEATUP MODE STEAM TEMP OVERLIM** **ITEMS NOT STERILE UNPLUG / RE-PLUG UNIT** Steam temperature exceeds 284°F (140°C) during HEAT UP mode.	Water ran out of chamber thru Vent or Fill Valve resulting in an overheat condition.	Check condition of Vent and Fill Valves to assure they are not leaking thru valve.	Replace malfunctioning valve if required. (Refer to para 4.18).

Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Code C573. (Continued) (Error Type: *FATAL*)	(Continued) **C573: HEATUP MODE STEAM TEMP OVERLIM** **ITEMS NOT STERILE UNPLUG / RE-PLUG UNIT** Steam temperature exceeds 284°F (140°C) during HEAT UP mode.	Tray Plate installed backward in chamber causing water level sensor shorting to plate resulting in no fill and heaters to overheat.	Check to assure Tray Plate is installed correctly.	Inform operator of correct position of Tray Plate.
		Steam Temperature Sensor (RTD) malfunctioning.	Remove plug connector at J12 on P.C. Board and check resistance value (ohms) of RTD between white and red leads. Resistance values should be between the following: 75°F (23°C) = 1090 ohms. 545°F (285°C) = 2066 ohms. *Above values +/- 10 Ohms*	If Steam Temperature probe shows open or values outside resistance ranges replace probe (Refer to para 4.10).
		Pressure line to Pressure Transducer restricted or clogged.	Check for restriction in tubing and chamber access hole for Pressure Transducer.	Clear any restriction that could prevent chamber pressure from reaching Pressure Transducer.
		Pressure Transducer or Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4 & pins of Pressure Transducer. (Refer to Schematic in Section 5). Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C574. (Error Type: *FATAL*)	**C574: STERILIZE MODE STEAM TEMP OVERLIM** **ITEMS NOT STERILE UNPLUG / RE-PLUG UNIT** Steam temperature exceeds 284°F (140°C) during STERILIZE mode.	Water ran out of chamber thru Vent or Fill Valve resulting in an overheat condition.	Check condition of Vent and Fill Valves to assure they are not leaking thru valve.	Replace malfunctioning valve if required. (Refer to para 4.18).
		Steam Temperature Sensor (RTD) malfunctioning.	Remove plug connector at J12 on P.C. Board and check resistance value (ohms) of RTD between white and red leads. Resistance values should be between the following: 75°F (23°C) = 1090 ohms. 545°F (285°C) = 2066 ohms. *Above values +/- 10 Ohms*	If Steam Temperature probe shows open or values outside resistance ranges replace probe (Refer to para 4.10).
		Pressure line to Pressure Transducer restricted or clogged.	Check for restriction in tubing and chamber access hole for Pressure Transducer.	Clear any restriction that could prevent chamber pressure from reaching Pressure Transducer.

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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Code C574.(Continued) (Error Type: *FATAL*)	(Continued) **C574: STERILIZE MODE STEAM TEMP OVERLIM** **ITEMS NOT STERILE UNPLUG / RE-PLUG UNIT** Steam temperature exceeds 284°F (140°C) during STERILIZE mode.	Pressure Transducer or Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4 & pins of Pressure Transducer. (Refer to Schematic in Section 5). Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C575. (Error Type: *FATAL*)	**C575: VENT MODE STEAM TEMP OVERLIM** **ITEMS NOT STERILE * UNPLUG / RE-PLUG UNIT** Steam temperature exceeds 284°F (140°C) during VENT mode.	Filter screen in chamber restricted.	Remove filter screen and check condition.	Clean or replace filter screen.
		Vent Valve malfunctioning or related lines or fittings restricted.	Run Service Diagnostics and check Vent Valve operation and check for debris in Valve and related lines and fittings.	Clean or replace Vent Valve, related lines and fittings (Refer to para 4.18).
		Steam Temperature Sensor (RTD) malfunctioning.	Remove plug connector at J12 on P.C. Board and check resistance value (ohms) of RTD between white and red leads. Resistance values should be between the following: 75°F (23°C) = 1090 ohms. 545°F (285°C) = 2066 ohms. *Above values +/- 10 Ohms*	If Steam Temperature probe shows open or values outside resistance ranges replace probe (Refer to para 4.10).
		Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4. Remove plug connector at J12 on P.C. Board and check voltage on pins 1 & 2. Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C577. **(Error Type: *FATAL*)**	**C577: DRY MODE STEAM TEMP OVERLIM** **UNPLUG / RE-PLUG UNIT** Steam temperature exceeds 284°F (140°C) during DRY OPEN mode.	Steam Temperature Sensor (RTD), located in rear of chamber, malfunctioning.	Remove plug connector at J12 on P.C. Board and check resistance value (ohms) of RTD between white and red leads. Resistance values should be between the following: 75°F (23°C) = 1090 ohms. 545°F (285°C) = 2066 ohms. *Above values +/- 10 Ohms*	If Steam Temperature probe shows open or values outside resistance ranges replace probe (Refer to para 4.10).

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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Code C577. (Continued) (Error Type: *FATAL*)	(Continued) **C577: DRY MODE STEAM TEMP OVERLIM** **UNPLUG / RE-PLUG UNIT** Steam temperature exceeds 284°F (140°C) during DRY OPEN mode.	Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4. Remove plug connector at J12 on P.C. Board and check voltage on pins 1 & 2. Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C633. (Error Type: *FATAL*)	**C633: HEATUP MODE PRESSURE LOW** **ITEMS NOT STERILE UNPLUG / RE-PLUG UNIT** After Air Valve closes if chamber pressure doesn't reach 1 Psig in 1 minute or gauge pressure inside chamber does not reach at least 4.93 PSIg (34 kPag) within 25 minutes since the beginning of HEAT UP mode. .	Door gasket leaking.	Check door gasket for leakage.	Replace door gasket (Refer to para 4.8).
		Pressure Relief Valve leaking.	Check for pressure leaking from pressure relief valve.	Run Pressure Relief Valve Test (Refer to para 4.16). If pressure relief valve continues to leak replace it (Refer to para 4.17).
		Vent Valve leaking.	Check for leakage from Vent Valve.	Replace Vent Valve (Refer to para 4.18).
		Air Valve leaking.	Check for leakage from Air Valve.	Replace Air Valve (Refer to para 4.15).
		Leakage around fittings, etc.	Check for leakage around fittings.	Tighten or replace leaking fitting(s).
		Steam Heater malfunctioning.	Check Steam Heater resistance and for grounding. 115 VAC = 10 Ohms* 230 VAC = 38 Ohms* *(+/- 10% cold reading)*	If Steam heater shows open or short replace heater (Refer to para 4.20).
		Pressure Transducer or Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4 & pins of Pressure Transducer. (Refer to Schematic in Section 5). Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C645. (Error Type: *RESTART*)	**C645: VENT MODE PRESSURE HIGH** **ITEMS NOT STERILE PUSH STOP TO RESTART** Absolute pressure inside chamber is greater than 0.7 PSIg (5 kPa) for longer than 5 minutes (i.e., Vent mode not complete).	Vent Valve malfunctioning.	•Run Service Diagnostics and check Vent Valve Operation. •If Vent Valve does not operate check for line voltage at terminals of valve. •If line voltage is present but valve does not operate, disconnect power from unit. Disconnect leads from Vent Valve coil and check continuity. 115 VAC = 0.4 MOhms 230 VAC = 3.2 MOhms (cold readings +/- 10 %) If no continuity replace valve.	Replace Vent Valve Assembly (Refer to para 4.18).

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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Code C645. (Continued) (Error Type: *RESTART*)	(Continued) **C645: VENT MODE PRESSURE HIGH** **ITEMS NOT STERILE PUSH STOP TO RESTART** Absolute pressure inside chamber is greater than 0.7 PSIg (5 kPa) for longer than 5 minutes (i.e., Vent mode not complete).	Pressure Transducer or Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4 & pins of Pressure Transducer. (Refer to Schematic in Section 5). Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C647. (Error Type: *RESTART*)	**C647: DRY MODE PRESSURE HIGH** **PUSH STOP TO RESTART** Gauge pressure inside chamber is equal to or greater than 2.18 PSIg (15 kPa) during DRY mode or 0.7 PSIg (5 kPa) during DOOR mode.	Door did not fully open even though latch released allowing chamber to retain a slight pressure. Door Gasket may have stuck due to abnormally high temperatures at Start-up (230° F [110° C] or above) due to running back-to-back cycles over a period of time.	Run Service Diagnostics to check component operation. Check amount of cycles (back-to-back) Operator ran before problem occurred. Check condition of door gasket.	If door gasket is worn or dirty clean or replace gasket (Refer to para 4.8). Inform Operator that problem could occur when back-to-back cycles have been ran and Start-up temperature is 230° F [110° C] or above.
		Filter screen in chamber restricted.	Remove filter screen and check condition.	Clean or replace filter screen.
		Vent Valve malfunctioning or related lines or fittings restricted.	Run Service Diagnostics and check Vent Valve operation and check for debris in Valve and related lines and fittings.	Clean or replace Vent Valve, related lines and fittings (Refer to para 4.18).
		Pressure Transducer or Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4 & pins of Pressure Transducer. (Refer to Schematic in Section 5). Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C660. (Error Type: *FATAL*) **Note**: When a Code ends in "0" it means unit had a supply power interruption. The operator could have unplugged the unit when a previous Code was displayed. *Always go to Service Diagnostics and check previous 5 codes that are displayed.*	**C660: POWER UP MODE PRESSURE HARDWARE** **UNPLUG / RE-PLUG UNIT** Pressure A / D converter reports an average value outside the limits for normal operation during POWER UP mode.	May be due to a malfunction that occurred previously to Code displayed.	Go to Service Diagnostics and check previous 5 displayed codes.	Refer to Code Numbers in Troubleshooting Guide to determine correction.
		Pressure Transducer or Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4 & pins of Pressure Transducer. (Refer to Schematic in Section 5). Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).

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SECTION II
TESTING AND TROUBLESHOOTING

Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Code C661 SELECT **Code C662** FILL **Code C663** HEATUP **Code C664** STERILIZE **Code C665** VENT **Code C667** DRY (Error Type: *FATAL*)	*(Refer to column on left for codes and description)* **C66X: XXXXXX MODE PRESSURE HARDWARE** **UNPLUG / RE-PLUG UNIT** Pressure A / D converter reports an average value outside the limits for normal operation during specific mode.	Pressure Transducer or Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4 & pins of Pressure Transducer. (Refer to Schematic in Section 5). Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C670. (Error Type: *FATAL*) **Note**: When a Code ends in "0" it means unit had a supply power interruption. The operator could have unplug the unit when a previous Code was displayed. *Always go to Service Diagnostics and check previous 5 codes that are displayed.*	**C670: POWER UP MODE PRESSURE OVERLIM** **UNPLUG / RE-PLUG UNIT** Gauge pressure inside chamber is greater than 34.8 PSIg (240 kPa) during POWER UP mode.	May be due to a malfunction that occurred previously to Code displayed.	Go to Service Diagnostics and check previous 5 displayed codes.	Refer to Code Numbers in Troubleshooting Guide to determine correction.
		Vent Valve malfunctioning.	•Run Service Diagnostics and check Vent Valve Operation. •If Vent Valve does not operate check for line voltage at terminals of valve. •If line voltage is present but valve does not operate, disconnect power from unit. Disconnect leads from Vent Valve coil and check continuity. 115 VAC = 0.4 MOhms 230 VAC = 3.2 MOhms (cold readings +/- 10 %) If no continuity replace valve.	Replace Vent Valve Assembly (Refer to para 4.13).
		Pressure Transducer or Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4 & pins of Pressure Transducer. (Refer to Schematic in Section 5). Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C671. (Error Type: *FATAL*)	**C671: SELECT MODE PRESSURE OVERLIM** **UNPLUG / RE-PLUG UNIT** Gauge pressure inside chamber is greater than 34.8 PSIg (240 kPa) during SELECT mode.	Vent Valve malfunctioning.	•Run Service Diagnostics and check Vent Valve Operation. •If Vent Valve does not operate check for line voltage at terminals of valve. •If line voltage is present but valve does not operate, disconnect power from unit. Disconnect leads from Vent Valve coil and check continuity. 115 VAC = 0.4 MOhms 230 VAC = 3.2 MOhms (cold readings +/- 10 %) If no continuity replace valve.	Replace Vent Valve Assembly (Refer to para 4.18).

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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Code C671. (Continued) (Error Type: *FATAL*)	(Continued) **C671: SELECT MODE PRESSURE OVERLIM UNPLUG / RE-PLUG UNIT** Gauge pressure inside chamber is greater than 34.8 PSIg (240 kPa) during SELECT mode.	Pressure Transducer or Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4 & pins of Pressure Transducer. (Refer to Schematic in Section 5). Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C672. (Error Type: *FATAL*)	**C672: FILL MODE PRESSURE OVERLIM ITEMS NOT STERILE UNPLUG / RE-PLUG UNIT** Gauge pressure inside chamber is greater than 34.8 PSIg (240 kPa) during FILL mode.	Air Valve malfunctioning.	Check operation of Air Valve by running Service Diagnostics and check coil resistance. Refer to Schematic of Main P.C. Board.	Replace Air Valve Assembly (Refer to para 4.15).
		Pressure Transducer or Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4 & pins of Pressure Transducer. (Refer to Schematic in Section 5). Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C673 HEATUP **Code C674** STERILIZE (Error Type: *FATAL*)	*(Refer to column on left for codes and description)* **C67X: XXXXXX MODE PRESSURE OVERLIM ITEMS NOT STERILE UNPLUG / RE-PLUG UNIT** Gauge pressure inside chamber is greater than 34.8 PSIG (240 kPa) during specific mode.	Air Valve malfunctioning.	Check operation of Air Valve by running Service Diagnostics and check coil resistance. Refer to Schematic of Main P.C. Board.	Replace Air Valve Assembly (Refer to para 4.15).
		Steam Temperature Sensor (RTD), located in rear of chamber, malfunctioning.	Remove plug connector at J12 on P.C. Board and check resistance value (ohms) of RTD between white and red leads. Resistance values should be between the following: 75°F (23°C) = 1090 ohms. 545°F (285°C) = 2066 ohms. *Above values +/- 10 Ohms*	If Steam Temperature probe shows open or values outside resistance ranges replace probe (Refer to para 4.10).
		Pressure Transducer or Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4 & pins of Pressure Transducer. (Refer to Schematic in Section 5). Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).

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SECTION II
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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Code C675 VENT (Error Type: *FATAL*)	*(Refer to column on left for codes and description)* **C67X: XXXXXX MODE PRESSURE OVERLIM** **ITEMS NOT STERILE UNPLUG / RE-PLUG UNIT** Gauge pressure inside chamber is greater than 34.8 PSIG (240 kPa) during specific mode.	Filter screen in chamber restricted.	Remove filter screen and check condition.	Clean or replace filter screen.
		Vent Valve malfunctioning or related lines or fittings restricted.	•Run Service Diagnostics and check Vent Valve Operation. Check for debris in lines and valve. •If Vent Valve does not operate check for line voltage at terminals of valve. •If line voltage is present but valve does not operate, disconnect power from unit. Disconnect leads from Vent Valve coil and check continuity. 115 VAC = 0.4 MOhms 230 VAC = 3.2 MOhms (cold readings +/- 10 %) If no continuity replace valve.	Clean or replace Vent Valve, related lines and fittings (Refer to para 4.18).
		Pressure Transducer or Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4 & pins of Pressure Transducer. (Refer to Schematic in Section 5). Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C677. (Error Type: *FATAL*)	**C677: DRY MODE PRESSURE OVERLIM** **UNPLUG / RE-PLUG UNIT** Gauge pressure inside chamber is greater than 34.8 PSIG (240 kPa) during DRY mode.	Door did not fully open even though latch released allowing chamber to retain a slight pressure.	Run Service Diagnostics to check component operation. Check number of cycles (back-to-back) Operator ran before problem occurred. Check condition of door gasket.	If door gasket is worn or dirty clean or replace gasket (Refer to para 4.XX). Inform Operator that problem could occur when back-to-back cycles have been run and Start-up temperature is 230° F [110° C] or above.
		Vent Valve malfunctioning or related lines or fittings restricted.	•Run Service Diagnostics and check Vent Valve Operation. Check for debris in lines and valve. •If Vent Valve does not operate check for line voltage at terminals of valve. •If line voltage is present but valve does not operate, disconnect power from unit. Disconnect leads from Vent Valve coil and check continuity. 115 VAC = 0.4 MOhms 230 VAC = 3.2 MOhms (cold readings +/- 10 %) If no continuity replace valve.	Clean or replace Vent Valve, related lines and fittings (Refer to para 4.18).

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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Code C677. (Continued) (Error Type: *FATAL*)	(Continued) **C677: DRY MODE PRESSURE OVERLIM** **UNPLUG / RE-PLUG UNIT** Gauge pressure inside chamber is greater than 34.8 PSIG (240 kPa) during DRY mode.	Pressure Transducer or Main P.C. Board Malfunctioning.	Check for 5.0 VDC between TP2 & TP4 & pins of Pressure Transducer. (Refer to Schematic in Section 5). Voltage should be apprx. 4.5 VDC at all times with unit plugged in. Also, run Service Diagnostics.	If voltage is not present or Service Diagnostics reveals a problem replace P.C. Board (Refer to para 4.13).
Code C980. (Error Type: *FATAL*) **Note**: When a Code ends in "0" it means unit had a supply power interruption. The operator could have unplug the unit when a previous Code was displayed. *Always go to Service Diagnostics and check previous 5 codes that are displayed.*	**C980: POWER UP MODE HI-LIMIT OPEN** **UNPLUG / RE-PLUG UNIT** High Limit Switch has opened for at least 1/4 second during POWER UP mode.	May be due to a malfunction that occurred previously to displayed code.	Go to Service Diagnostics and check previous 5 displayed codes.	Refer to Code Numbers in Troubleshooting Guide to determine correction.
		Water level of reservoir is covering outlet of condensing coil. Water siphons back into chamber resulting in low temperature.	Check if condensing coil outlet is beneath water level in reservoir.	Inform operator not to over fill reservoir. If reservoir is not over filled but coil outlet is submerged, bend coil so outlet is a maximum of 1 7/8" below top of lid opening. Do not allow coil to touch top or sides of reservoir.
		High Limit Switch(s) is weak and opens prematurely.	Disconnect power and check continuity across high limit switches. Limits opens at 425°F (218°C) to 475°F (246°C) Close at 325°F (163°C) to 375° F (191° C)	If continuity is not present and temperature at limit is below the Limit's "Open" temperature replace Limit Switch (Refer to para 4.19).
		High Limit Switch(es) opened normally due to temperature surpassing 425°F (218°C) to 475°F (246°C)	Disconnect power and allow unit to cool. Run Service Diagnostics and check individual components to assure they are functioning correctly.	If a component malfunctioned, producing the overheat condition, repair or replace the specific component.
		Wires or connectors at High Limit Switch(es) loose, disconnected or broken.	Check conditions of all connectors and related wires.	Repair or replace connectors or wires. Refer to Section 5 for Schematics.
		P.C. Board malfunctioning.	Run Service Diagnostics and make various voltage checks as indicated on P.C. Schematic.	Replace P.C. Board (Refer to para 4.13).
Code C981 SELECT **Code C982 FILL** **Code C983 HEATUP** **Code C984 STERILIZE** **Code C985 VENT** (Error Type: *FATAL*)	*(Refer to column on left for codes and description)* **C98X: XXXXXX MODE HI-LIMIT OPEN** **UNPLUG / RE-PLUG UNIT** High Limit switch(es) has opened for at least 1/4 second during specific mode.	High Limit Switch(es) is weak and opens prematurely.	Disconnect power and check continuity across high limit switch. Limits opens at 425°F (218°C) to 475°F (246°C) Close at 325°F (163°C) to 375° F (191° C)	If continuity is not present and temperature at limit is below the Limit's "Open" temperature replace Limit Switch (Refer to para 4.19).
		High Limit Switch(es) opened normally due to temperature surpassing 425°F (218°C) to 475°F (246°C)	Disconnect power and allow unit to cool. Run Service Diagnostics and check individual components to assure they are functioning correctly.	If a component malfunctioned, producing the overheat condition, repair or replace the specific component.
		Wires or connectors at High Limit Switch(es) loose, disconnected or broken.	Check conditions of all connectors and related wires.	Repair or replace connectors or wires. Refer to Section 5 for Schematics.

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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
(Continued) **Code C981 SELECT** **Code C982 FILL** **Code C983 HEATUP** **Code C984 STERILIZE** **Code C985 VENT** (Error Type: *FATAL*)	(Continued) *(Refer to column on left for codes and description)* **C98X: XXXXXX MODE HI-LIMIT OPEN** **UNPLUG / RE-PLUG UNIT** High Limit switch(es) has opened for at least 1/4 second during specific mode.	P.C. Board malfunctioning.	Run Service Diagnostics and make various voltage checks as indicated on P.C. Schematic.	Replace P.C. Board (Refer to para 4.13).
Code C987. (Error Type: *FATAL*)	**C987: DRY MODE HI-LIMIT OPEN** **UNPLUG / RE-PLUG UNIT** High Limit switch(es) has opened for at least 1/4 second during DRY mode.	Water level of reservoir is covering outlet of condensing coil. Water siphons back into chamber resulting in low temperature.	Check if condensing coil outlet is beneath water level in reservoir.	Inform operator not to over fill reservoir. If reservoir is not over filled but coil outlet is submerged, bend coil so outlet is a maximum of 1 7/8" below top of lid opening. Do not allow coil to touch top or sides of reservoir.
		High Limit Switch(es) is weak and opens prematurely.	Disconnect power and check continuity across high limit switch. Limits opens at 425°F (218°C) to 475°F (246°C) Close at 325°F (163°C) to 375° F (191° C).	If continuity is not present and temperature at limit is below the Limit's "Open" temperature replace Limit Switch (Refer to para 4.19).
		High Limit Switch(es) opened normally due to temperature surpassing Limits opens at 425°F (218°C) to 475°F (246°C)	Disconnect power and allow unit to cool. Run Service Diagnostics and check individual components to assure they are functioning correctly.	If a component malfunctioned, producing the overheat condition, repair or replace the specific component.
		Wires or connectors at High Limit Switch(es) loose, disconnected or broken.	Check conditions of all connectors and related wires.	Repair or replace connectors or wires. Refer to Section 5 for Schematics.
		P.C. Board malfunctioning.	Run Service Diagnostics and make various voltage checks as indicated on P.C. Schematic.	Replace P.C. Board (Refer to para 4.13).
(Non-Coded Errors) **Sterilizer not drying instruments properly.**	Instruments are wet after drying cycle is complete.	Sterilizer overloaded	Check that pressure vessel is not overloaded with heavy linen packs.	Remove packs, allow unit to cool and run a cycle. Instruct operator to reduce load size.
		Operator fully opened or closed the door before Dry Cycle was complete.	Have Operator run a cycle and check if door is being fully opened or closed before Dry Cycle is complete.	Explain proper operation to assure adequate drying.
		Sterilizer not level allowing additional water to accumulate in chamber.	Check sterilizer for level.	Level unit.
		Chamber Filter clogged preventing all the water from venting to reservoir.	Check condition of filter.	Clean or replace filter (Refer to para 4-7).

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Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
(Continued) ***(Non-Coded Errors)*** **Sterilizer not drying instruments properly.**	(Continued) Instruments are wet after drying cycle is complete.	Vent Valve malfunctioning or related lines or fittings restricted.	•Run Service Diagnostics and check Vent Valve Operation. Check for debris in lines and valve. •If Vent Valve does not operate check for line voltage at terminals of valve. •If line voltage is present but valve does not operate, disconnect power from unit. Disconnect leads from Vent Valve coil and check continuity. 115 VAC = 0.4 MOhms 230 VAC = 3.2 MOhms (cold readings +/- 10 %) If no continuity replace valve.	Clean or replace Vent Valve, related lines and fittings (Refer to para 4.18).
		Heater not functioning.	Run Service Diagnostics and check operation heater, and various components.	Replace malfunctioning heater or related component(s).
		High Limit Switch(es) is stuck in an “open” position.	Disconnect power and check continuity across High Limit Switch. Limits opens at 425°F (218°C) to 475°F (246°C) Close at 325°F (163°C) to 375° F (191° C)	If continuity is not present and temperature at limit is below the Limits “Open” temperature replace Limit Switch (Refer to para 4.19).
(Non-Coded Errors) **Biological indicator strip designates unit not sterilizing.**	Positive biological indicator.	Sterilizer overloaded	Check that pressure vessel is not overloaded with heavy linen packs.	Remove packs, allow unit to cool and run a cycle. Instruct operator to reduce load size.
		Improper operation.	Procedures used by operator(s).	Demonstrate Normal Operation to operator(s).
	No color change, or incomplete change has occurred on chemical indicator strip.	Using trays for instruments not manufactured for sterilizer. Does not get proper air flow or steam penetration.	Check style of instrument trays being used.	Explain to operator(s) to use only trays manufactured for use in M9 / M11 Sterilizer.
		Wrong type of biological indicator being used for this type sterilizer.	Check biological indicator to assure it is for gravity type sterilizers and correct for the cycle times and temperatures being run.	Contact supplier of biological indicator to acquire correct indicators. Review Installation / Operation Manual for correct procedures.
		Chemical indicator strip has come into contact with water in the sterilizer.	Check with operator on positioning of indicator strip in sterilizer.	Explain to operator correct positioning to prevent direct contact with water.
		Indicator strips are being stored in damp and / or hot environment.	Check condition of area where indicators are stored.	Inform operator to follow storage recommendation of indicator manufacturer.

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SECTION II
TESTING AND TROUBLESHOOTING

Table 2-3. Troubleshooting Guide

Problem	Display / Symptom	Probable Cause	Check	Correction
Maintenance Message is displayed.	**PERFORM MONTHLY MAINTENANCE PERFORM WEEKLY MAINTENANCE**	Sterilizer software senses that the cycle count has reached 28 days from initial start-up or monthly maintenance.	Check unit and refer to Installation / Operation manual for correct maintenance procedures.	Perform monthly maintenance per I/O manual.
		Sterilizer software senses that the cycle count has reached 7, 14, or 21 days from initial start-up or monthly maintenance.	Check unit and refer to Installation / Operation manual for correct maintenance procedures.	Perform weekly maintenance per I/O manual.
Printer (Optional) does not print.	Printer does not generate data.	Printer is out of paper.	Lift printer cover and check condition of paper.	Install new roll of paper (refer to I/O manual).
		Cartridge ribbon is dry.	Check condition of cartridge ribbon.	Install a new cartridge ribbon (refer to I/O manual).
		Printer wire harness is disconnected.	Check if printer harness is plugged in on terminal pins of printer and on plug J14 of Main P.C. board.	Plug wire harness in at printer connection and / or plug J14 on main P.C. board (refer to I/O manual.
		Printer wire harness has broken or open lead.	Check continuity of leads on wire harness.	Replace printer wire harness.
		Printer is malfunctioning.	Check for 5 VDC on pins 7 & 8 at Printer.	If voltage is present, replace printer (Refer to para 4-23).
			Check for 5 VDC on pins 7 & 8 at plug J14 on Main P.C. board.	If no voltage is present replace Main P.C. board (Refer to para 4.13).

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SECTION III
SCHEDULED MAINTENANCE

3.1 Scheduled Maintenance

Table 3-1 is a Scheduled Maintenance Chart which lists the inspections and services that should be performed periodically on the Model M9 or M11 Sterilizers. These inspections and services should be performed as often as indicated in the chart.
Also, periodically the display on the Sterilizer will inform the operator that either a Weekly or Monthly Maintenance is required.
The Weekly Maintenance display occurs when the Sterilizer software senses that 7, 14, and 21 days have passed.
Monthly Maintenance is displayed when 28 days have passed.

Interval	Inspection or Service	What to Do
Weekly (Maintenance should be performed by Operator).	Clean Chamber and Trays.	Drain water from the Sterilizer using drain tube in front of unit. Allow unit to cool to prevent burns. Wash inside of chamber and trays with a solution of mild soap or Speed-Clean® and distilled water. Remove any debris in or around the mesh filters in the chamber and rinse the filter. Wipe off the door gasket and mating surfaces using a damp cloth and inspect gasket for damage. Replace gasket if necessary. Refer to Installation / Operation Manual.
Monthly (Maintenance should be performed by Operator).	Clean and flush the chamber and related plumbing. Wipe off trays.	Using Speedclean®, clean the chamber and related plumbing. Refer to the Installation / Operation Manual, Operator Maintenance for Monthly cleaning procedures.
Semi-annually	Obvious damage	Visually check condition of sterilizer for obvious damage such as: cracks in components, missing components, dents in components, or any other visible damage which would cause sterilizer to be unsafe to operate or would compromise its performance. Repair sterilizer as necessary.
	Fasteners / hardware	Check for missing or loose fasteners / hardware. Replace any missing hardware and tighten any loose hardware as necessary.
	Warning and instructional decals	Check for missing or illegible decals. Replace decals as necessary.
	Pivot points / moving parts.	Lubricate all exposed pivot points, and moving parts with high temperature, non-toxic, silicone based lubricant.
	Display Overlay	Check for missing, damaged, or illegible display overlay. Replace display overlay if necessary.
	Wiring Connections	Check condition of all wiring connections. Clean, tighten or replace any dirty, loose, or damaged connections.
	Free movement of door latch.	Clean door latch with solvent. Lubricate door latch and door pins with high temperature, non-toxic, silicone grease.
	Door interlock switch operation.	Check to assure door switch operates correctly. Run Service Diagnostics.
	Door gasket	Check gasket for deterioration. Clean and, if necessary, replace gasket (Refer to para 4.8).
	Chamber mesh filter.	Inspect, clean or replace filters if necessary (Refer to para 4.7).
	Water Level Sensor	Clean or replace water level sensor (Refer to para 4.21).
	Tubing	Inspect all tubing for cleanliness. Clean or replace if required.
	Reservoir	Inspect reservoir for cleanliness and clean or replace if required (Refer to para 4.22).
	Pressure Relief Valve	Perform a pressure relief valve check (Refer to para 4.16). Replace pressure relief valve if required (Refer to para 4.17)
	Printer (optional)	Check printer operation. Replace ribbon cartridge if required.
	Operational Test	Run a Normal Operation to determine if the sterilizer is operating within its specifications (Refer to para 2.1). If it is determined there is a problem run Service Diagnostic (Refer to para. 2.2) and review the Troubleshooting Guide (Refer to para 2.3) before replacing any components.
	Service Diagnostics Test	Run the Service Diagnostics (Refer to para. 2.2) to check the Main P.C. Board and various components.

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SECTION IV
MAINTENANCE / SERVICE INSTRUCTIONS

4.1 Safety Precautions

WARNING
Always disconnect power cord from outlet before removing any sterilizer covers/panels or making any repairs to prevent possibility of electrical shock. Allow unit to cool and drain unit to prevent spillage during repairs. Failure to comply could result in personal injury.

NOTE
Perform an operational test on sterilizer after the repair is completed to confirm repair was properly made and that all malfunctions were repaired.

4.2 Top Cover & Panels.

A. Removal

(1) Unplug unit power cord from electrical outlet.

(2) Remove screw (1, Figure 4-1) to separate pressure relief valve (2) from handle (3).

(3) Remove right side panel (4), three screws.

(4) If unit is equipped with a printer remove it (Refer to para. 4.23).

(5) Disconnect display cable from connector J3 on Display board (Refer to para. 4.3).

(6) Remove the remaining screws from the top cover (5) and remove the cover.

(7) Mark locations then disconnect the electrical leads from the receptacle (6) and fan motor (7) on the back panel (8).

(8) Remove back (8) and left side panel (9).

B. Installation

(1) Place top cover (5, Fig. 4-1) in position.

(2) Connect pressure relief valve handle (3) to pressure relief valve (2) with screw (1).

(3) Install left side (9) and back (8) panels securing with screws.

(4) If unit is equipped with a printer install it (Refer to para. 4.23).

(5) Connect display cable to connector J3 on Display board (Refer to para. 4.3).

(6) Connect the electrical leads to the receptacle (6) and fan motor (7).

(7) Install the right side panel (4).

(8) Plug power cord into electrical receptacle.

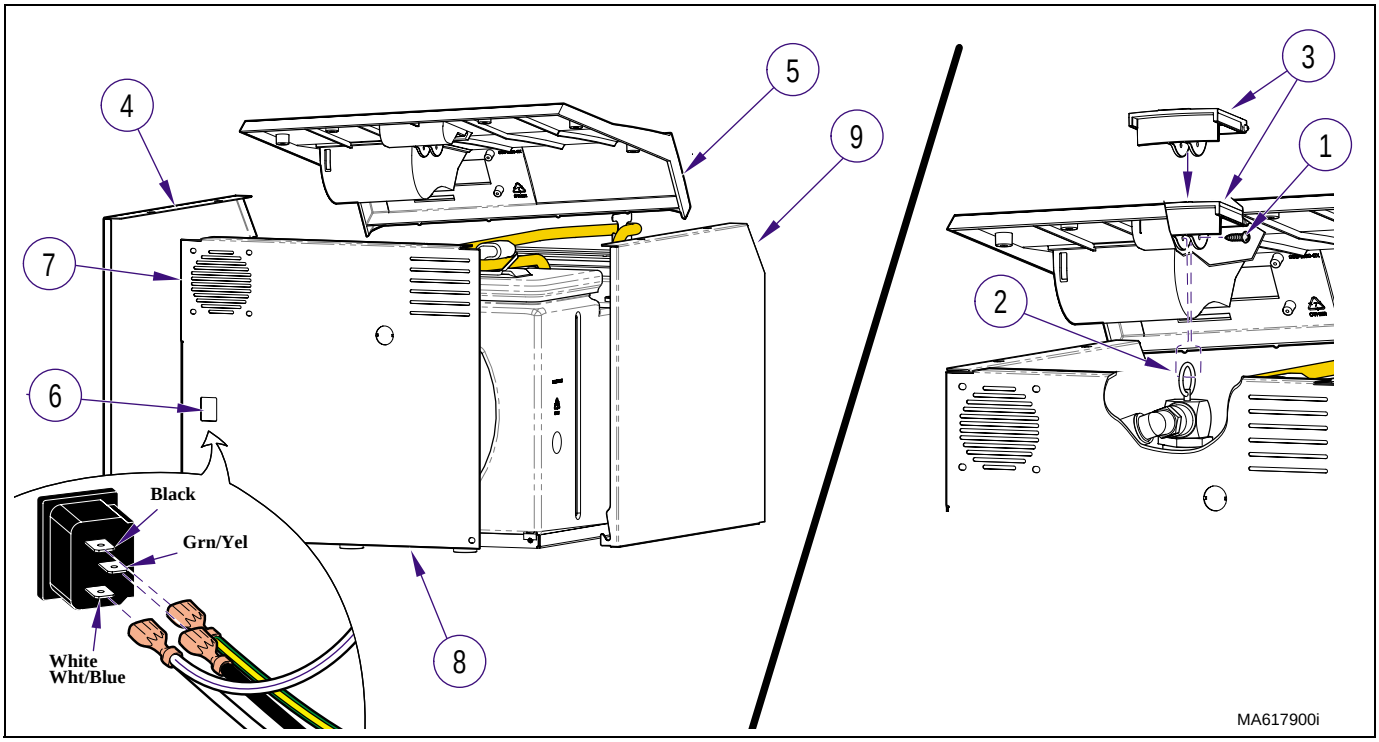

Figure 4-1. Top Cover & Panels

4.3 Display P.C. Board

A. Removal

(1) Unplug power cord from electrical outlet.

(2) Remove top cover (Refer to para 4.2).

(3) Disconnect display harness (1, Fig. 4-2) from connector J3 (2) of display PCB (3).

(4) Disconnect touchpad harness (4) from connector J2 (5) of display PCB (3)

NOTE
The Display PCB (3) may be stuck to the adhesive backing of the Decal Switch. Use care to prevent damage when separating the components. A plastic tab on the cover secures the one end of the Display PCB.

(5) Remove the two screws (6) and while carefully separating the Display PCB (3) from the Decal Switch, slide the Display PCB free from under the tab (A).

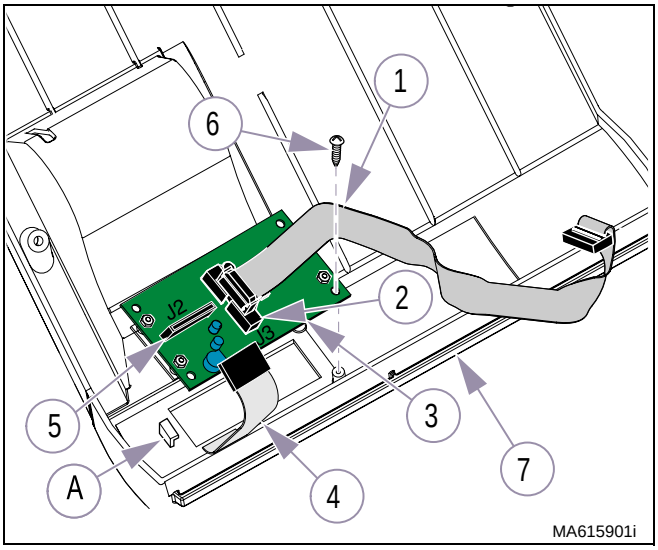

Figure 4-2. Display PCB

B. Installation

EQUIPMENT ALERT
Assure display PCB is positioned correctly when installing. An arrow indicating correct direction for UP is on front of PCB.

(1) Install display PCB (3, Figure 4-2) on top cover (7) securing with two screws.

(2) Connect touchpad harness (4) to connector J2 (5)

(3) Connect PCB harness (1) to connector J3 (2).

(4) Install top cover (Refer to para 4.2).

(5) Plug unit power cord into electrical outlet.

4.4 Decal Switch

A. Removal

(1) Unplug power cord from electrical outlet.

(2) Remove top cover (Refer to para 4.2).

(3) Disconnect ribbon harness (1, Figure 4-3) from display PCB (2).

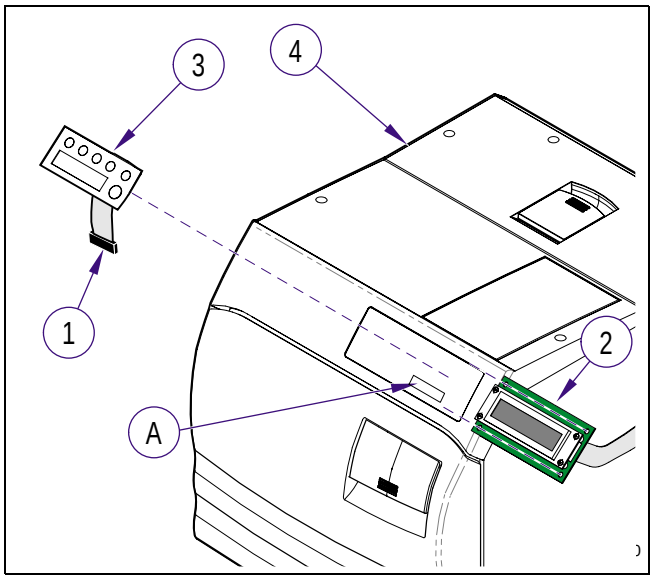

Figure 4-3 Decal Switch

(4) Using a sharp instrument, carefully remove decal switch (3) from front of top cover (4).

(5) Use an all citrus solvent / degreaser that does not harm plastics to remove all adhesive residue and then allow top cover to dry.

B. Installation

(1) Peel protective backing from back side of new decal switch (3, Figure 4-3).

(2) Install new decal switch (3) on top cover (4), making sure ribbon harness (1) is fed thru wire slot (A).

(3) Connect ribbon harness (1) to connector on display PCB (2).

(4) Install top cover (Refer to para 4.2).

(5) Plug power cord into electrical outlet.

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4.5 Tray Rack and Trays

A. Removal

(1) Allow unit to cool or use care when removing trays to prevent burns.

(2) After removing trays, pry upward (A, Fig.4-4) on end of tray plate with a screwdriver while pulling tray rack and plate assembly out (B) of chamber.

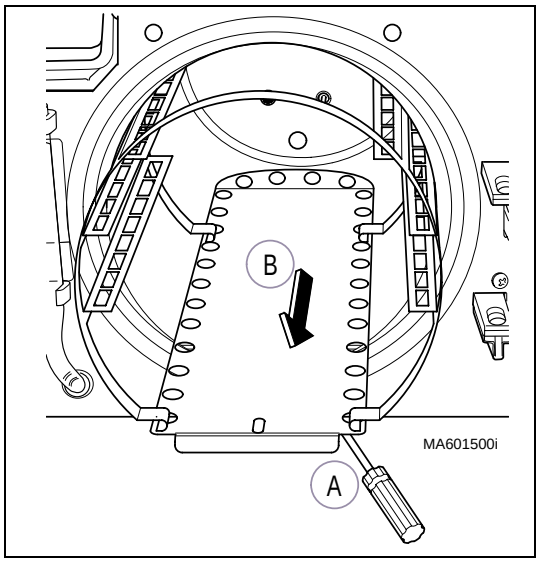

Figure 4-4. Tray Rack and Trays.

B. Installation

EQUIPMENT ALERT

Install tray rack and plate assembly so that angled end of plate is toward back of chamber. Do *not* allow plate to contact water lever sensor.

(1) Place back edge of tray in chamber. Pressing downward (A, Fig. 4-5) on top of tray rack, slowly insert assembly into chamber (B).

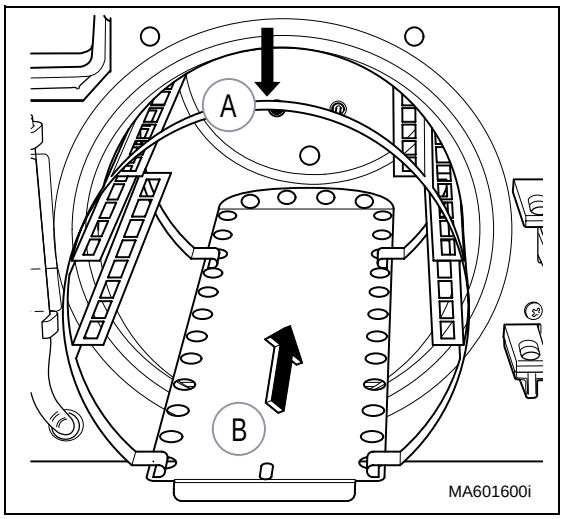

Figure 4-5. Tray Rack and Trays.

4.6 Draining / Filling Reservoir

A. Draining Sterilizer

NOTE

The reservoir capacity when full is approximately 1.4 gallon (5.3 liters) for the M11 and 1.1 gallon (4.1 liter) for the M9. Assure container used to drain reservoir into is of adequate capacity.

(1) Open sterilizer door.

(2) Pull level indicator tube (1, Figure 4-6) loose from hose clips (2). Place tube in a suitable empty container or sink that is below level of sterilizer and drain reservoir.

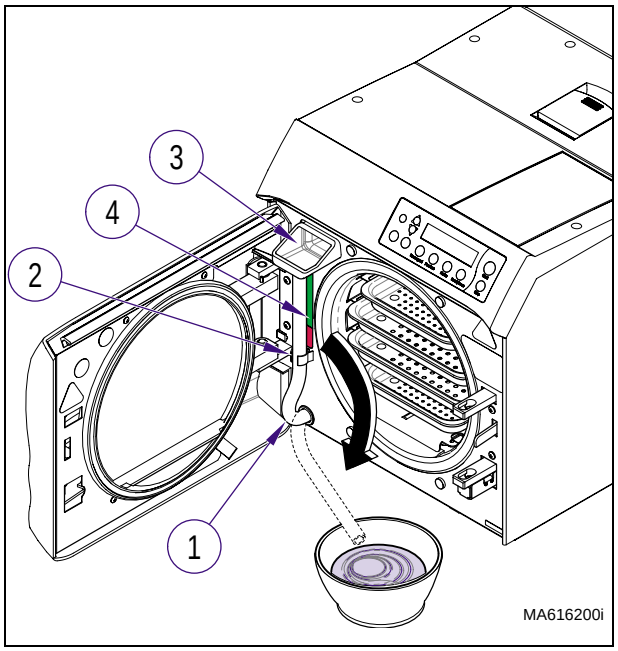

Figure 4-6. Draining / Filling Reservoir

B. Filling Sterilizer

(1) Place level indicator tube (1, Figure 4-6) in hose clips (2).

EQUIPMENT ALERT

Use only distilled water. The chlorine found in normal tap water has a severe corrosive effect on the stainless steel chamber. Failure to use distilled water may cause serious deterioration and premature failure of the stainless steel chamber.

(2) Pour *distilled water* into fill opening (4) until water level in level indicator tube (1) is at top of fill level label (5).

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4.7 Chamber Mesh Filters

A. Removal

(1) Open sterilizer door.

(2) Remove tray rack and trays (Refer to para 4.5).

(3) Using care not to damage filter, grasp filter (1, Figure 4-7) and gently pull outwards while twisting slightly (a pair of pliers or screwdriver may be used if filter is stuck).

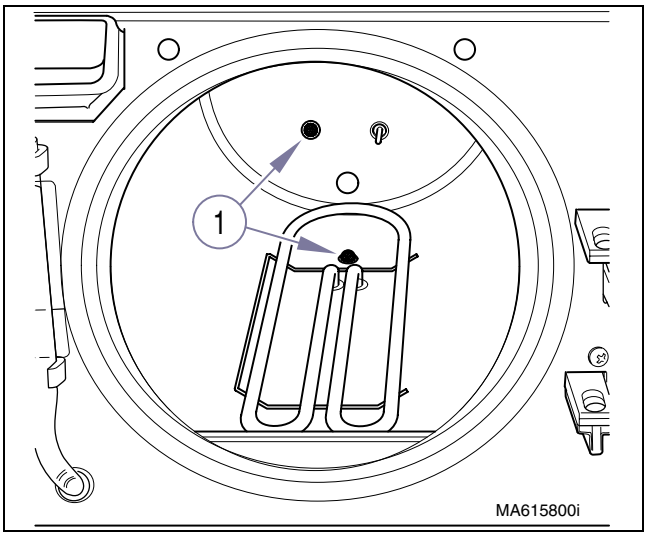

Figure 4-7.

(4) The filter may be cleaned with mild soap and distilled or demineralized water. A small stiff bristled brush or ultrasonic cleaner may be helpful to remove foreign objects from the filter surface. Rinse the filter with distilled or demineralized water.

B. Installation

(1) Install the filter (1, Figure 4-7) by inserting the filter into the hole (A) in the chamber bottom and pressing downwards while twisting slightly.

(2) Install tray rack and trays (Refer to para 4.5).

(3) Close sterilizer door.

4.8 Door, Dam Gaskets, & Steam Block

A. Removal

(1) Open sterilizer door.

(2) Remove dam gasket (1, Fig. 4-8) and door gasket (2).

(3) Remove the steam block gasket (3) by carefully extracting the snap clips (4).

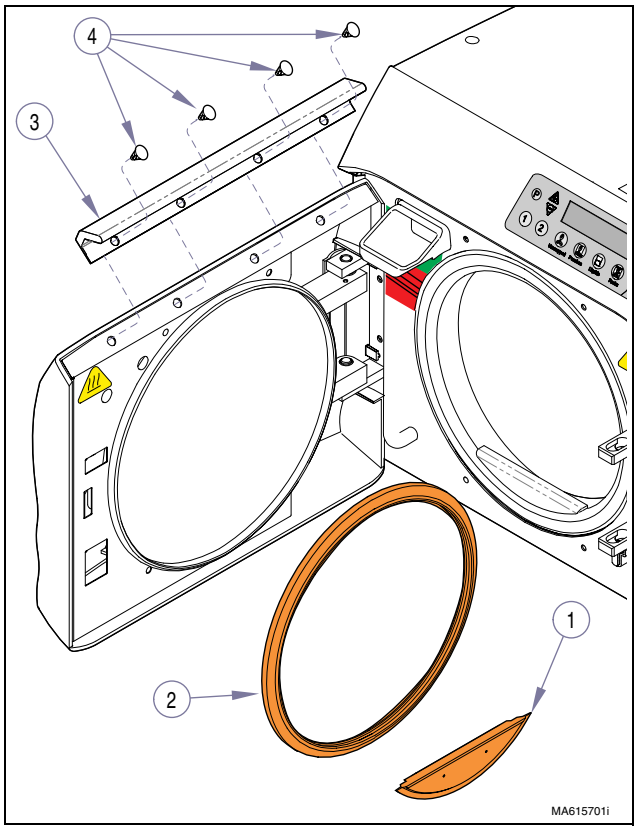

Figure 4-8. Door Gasket

B. Installation

EQUIPMENT ALERT
Clean the new door gasket with a mild solution of soap and water, then rinse with distilled water before installing.

(1) Clean the new gaskets.

NOTE
If not installed, first install the reinforcement wire in the gasket and then insert gasket in door.

(2) Install door gasket (2, Figure 4-8) and dam gasket (1).

(3) Install the steam block (3) securing with snap clips (4).

(4) Operate sterilizer and check for leaks.

4.9 Axial Flow Fan

A. Removal

(1) Unplug power cord.

(2) Remove right side panel (Refer to para 4.2).

(3) Disconnect two wires (1, Figure 4-9) from terminals of axial flow fan (2).

(4) Remove axial flow fan (2) (four screws).

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B. Installation

EQUIPMENT ALERT
Check fan intake openings; make sure intake is clear of any debris that would restrict air flow.

EQUIPMENT ALERT
Flow arrow on fan body must be pointed *toward* inside of case when installing fan.

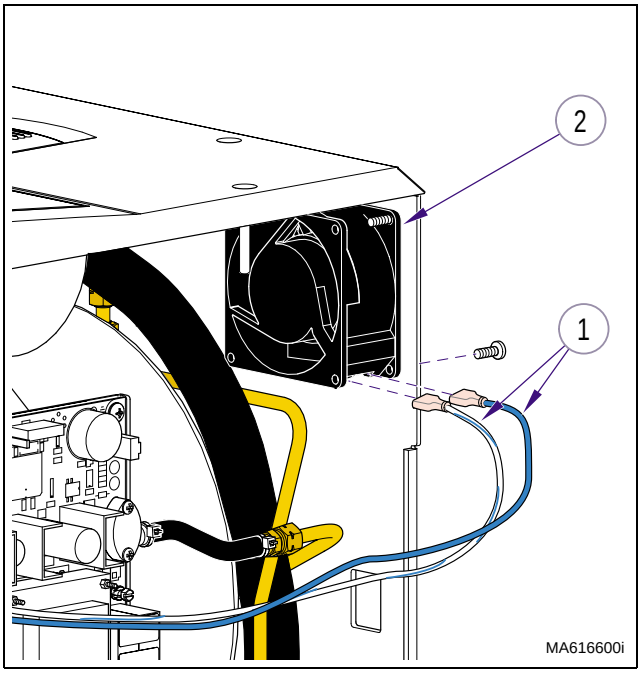

Figure 4-9. Axial Flow Fan

(1) Install axial flow fan (2, Figure 4-9) assuring flow arrow is point inward, and secure with four screws.

(2) Connect two wires (1)

(3) Install right side panel (Refer to para 4.2).

(4) Plug power cord into outlet receptacle.

4.10 Steam Temperature Sensor

A. Removal

(1) Unplug power cord.

(2) Remove right side and back panels (Refer to para 4.2).

(3) Disconnect temperature probe harness (1, Figure 4-10) from connector J12 on main p.c. board (2).

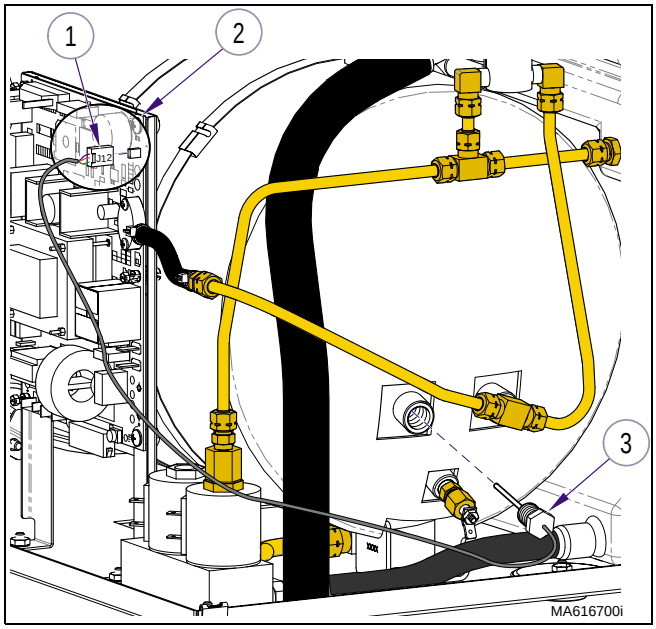

Figure 4-10. Steam Temperature Probe

(4) Remove temperature probe assembly (3) from fitting.

B. Installation

EQUIPMENT ALERT
Use a pipe thread compound on the sterilizer fittings capable of withstanding the operating pressures and temperatures. Do *not* use a teflon tape as particles may migrate through system and cause blockage.

(1) Coat threads of temperature probe assembly (3, Figure 4-10) with high temperature pipe thread compound (Loctite 565).

(2) Install temperature probe assembly (3).

(3) Connect temperature probe harness (1) to connector J12 on main p.c. board (2) .

(4) Run a cycle, to place pressure on fittings, then check for leaks.

(5) Install panels (Refer to para 4.2).

(6) Plug power cord into outlet receptacle.

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4.11 Door Latch Interlock Switch

A. Removal

(1) Unplug power cord from outlet receptacle.

(2) Remove R.H. side panel (Refer to para 4.2).

(3) Disconnect the two leads (A, Fig. 4-11) of door interlock switch (1) from PC Board (2) terminals J1 and J2.

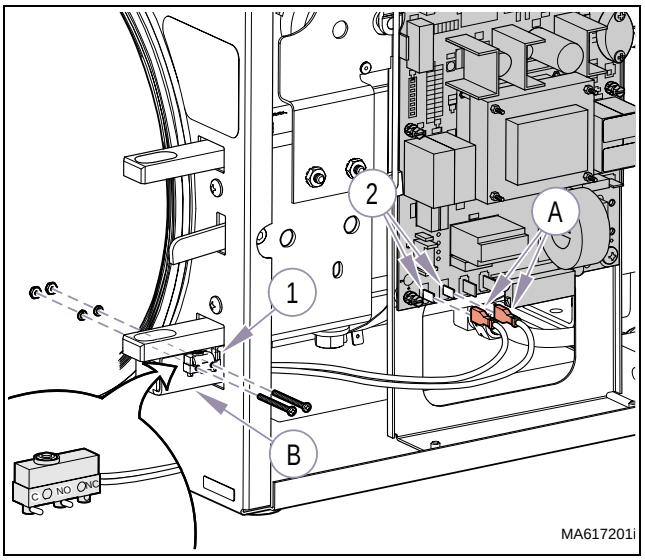

Figure 4-11. Door Latch Interlock Switch

(4) Remove interlock switch (1) (two screws, lockwashers, and nuts) from door bracket (B).

B. Installation

(1) Install interlock switch (1, Figure 4-11) in door bracket (B) securing with two screws, lockwashers and nuts.

(2) Install leads (A) of interlock switch (1) on terminals J1 and J2 of main P.C. board (2).

(3) Plug power cord into outlet receptacle.

(4) Run Service Diagnostics to check operation of door interlock switch (1) (refer to Service Diagnostics [Door Open Test], Para 2.2).

(5) Install R.H. side panel (Refer to para 4.2).

(6) Run a Sterilization Cycle and check operation.

4.12 Door Opening Motor Assemby

A. Removal

(1) Unplug power cord from outlet receptacle.

(2) Remove R.H. side panel (Refer to para 4.2).

(3) Disconnect the motor assembly plug connector (1, Figure 4-12) from J15 on PC Board.

NOTE
The motor connecting rod (2) must be installed in the same hole in the motor lever arm (3) from where it was removed.

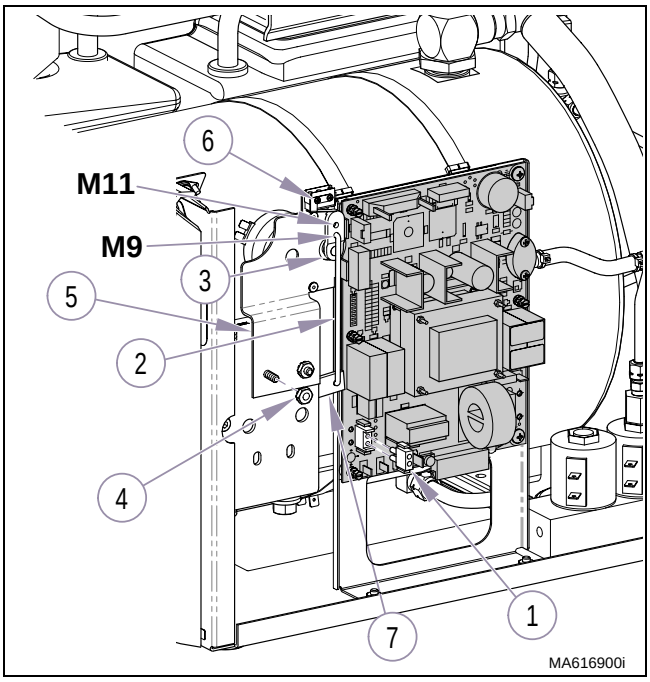

Figure 4-12. Door Opening Motor Assembly

(4) Mark the hole position on the motor lever arm (3) where the motor connecting rod (2) is inserted.

(5) After removing the mounting nuts (4), disconnect the motor connecting rod (2), and remove the motor mounting bracket (5).

(6) Remove the door motor switch and harness (6).

B. Installation

(1) Install the door motor switch (6, Figure 4-12) on the motor mounting bracket (5).

(2) Insert the motor connecting rod (2) into the hole that it was removed from on the motor lever arm (3), then insert the other end of the rod into the hole in the latch lever (7)

(3) Secure the motor mounting bracket (5) to the chamber bracket.

(4) Rotate the motor lever arm (3) downward until it is clear of the door motor switch (6).

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(5) Loosen the mounting screws on the door motor switch (6). Push the right end of the switch downward as far as possible and tighten the mounting screws.

(6) Plug power cord into outlet receptacle.

(7) Run a Sterilization Cycle and check operation.

4.13 Main Control P.C. Board

A. Removal

(1) Unplug power cord from outlet receptacle.

(2) Remove R.H. side panel (Refer to para 4.2).

(3) Tag and disconnect wire harnesses and electrical leads from main control p.c board assembly (1, Figure 4-13).

(4) Cut the high temperature cable tie (2) and remove the tube (3) from the pressure transducer (4).

(5) Remove the two mounting nuts (5) then remove main P.C. board assembly (1).

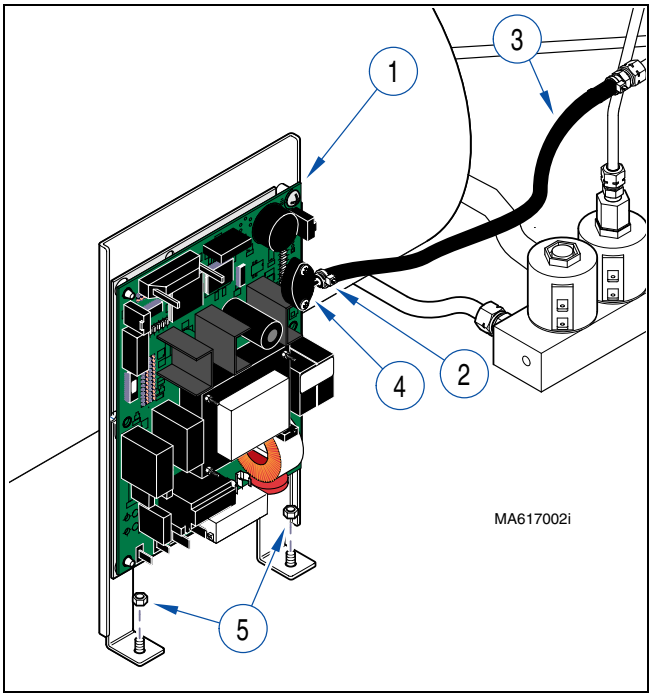

Figure 4-13. Main P.C. Board

B. Installation

(1) Install the main p.c. board assembly (1, Figure 4-13) and secure with the two mounting nuts (5).

(2) Connect the wire harnesses, and electrical leads.

(3) Connect the tube (3) to the pressure transducer (4) and secure with a high temperature cable tie (2).

(4) Plug unit into an electrical outlet and run Service Diagnostics to check operation of various components (refer to Service Diagnostics, Para 2.2).

(5) Install R.H. side panel (Refer to para 4.2).

4.14 Fan Thermostat

A. Removal

(1) *Unplug power cord from outlet receptacle*.

(2) Remove R.H. side panel (Refer to para 4.2).

(3) Disconnect leads from terminals of fan thermostat (1, Figure 4-14).

(4) Remove fan thermostat (1) and bracket (2) assembly.

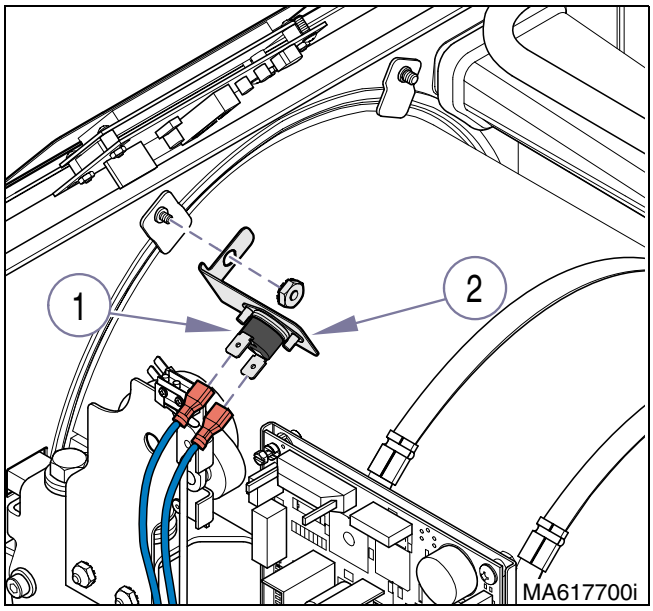

Figure 4-14. Fan Thermostat

B. Installation

(1) Install fan thermostat (1, Figure 4-14) and bracket (2) assembly.

(2) Connect electrical leads to fan thermostat (1).

(3) Install R.H. side panel (Refer to para 4.2).

4.15 Air Solenoid Valve

A. Removal

(1) Unplug power cord from outlet receptacle.

(2) Remove R.H. side and Back panels (Refer to para 4.2).

(3) Disconnect two wires from terminals of air solenoid valve (1, Figure 4-15) .

(4) Loosen two compression nuts (2) and remove air solenoid valve (1) from unit.

(5) Remove two male fittings (3) from air solenoid valve (1).

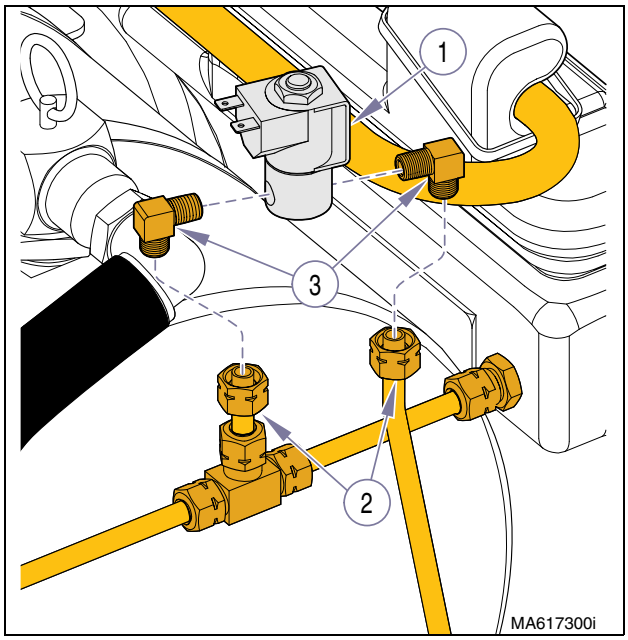

Figure 4-15. Air Solenoid Valve

B. Installation

EQUIPMENT ALERT

Use a pipe thread compound on the sterilizer fittings capable of withstanding the operating pressures and temperatures. Do *not* use a teflon tape as particles may migrate through system and cause blockage.

(1) Coat threads of male fittings (3, Figure 4-15) with high temperature hydraulic sealant (Loctite 565). and install the fittings onto the valve (2)

NOTE

The **"In"** port of the valve faces toward the reservoir.

(2) Install air solenoid valve (1) securing with two compression nuts (2).

(3) Connect two wires to the valve terminals.

(4) Plug unit in, run a cycle to place pressure on lines and fittings, then check for leaks.

(5) Run Service Diagnostics to check operation of Air Solenoid Valve (refer to Service Diagnostics [Air Valve Test], Para 2.2).

(6) Install panels (Refer to para 4.2).

4.16 Pressure Relief Valve Test

NOTE

Pressure relief valve operation must be checked whenever servicing the unit or by the end user *at least once per month*.

(1) Press UNWRAPPED

(2) Press START

WARNING

During the pressure relief check steam is vented from under the sterilizer. To avoid being burnt, place a rolled up towel around the bottom of the sterilizer.

(3) Wait until pressure in chamber reaches at least 25 PSI during the Heating cycle.

Display: ***HEATING - UNWRAPPED 268°F 25.5 PSI***

(4) Pull upward on the pressure relief valve handle (A, Figure 4-16) for a brief period. Steam should discharge freely from beneath the unit.

NOTE

If the pressure relief valve does not completely close when lever is released, pull upward again and release it quickly so valve *"snaps"* back into position. Do this until valve seats properly.

(5) Release handle (B). Valve should close, stopping release of steam.

(6) Press STOP to abort cycle, preventing unit from over-heating.

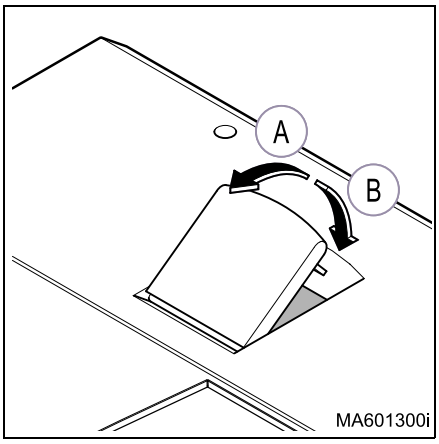

Figure 4-16. Pressure Relief

(7) If excessive force is required to open pressure relief valve or pressure relief valve will not reseat properly, the pressure relief valve must be replaced (Refer to para. 4.17).

4.17 Pressure Relief Valve

A. Removal

(1) Unplug power cord from outlet receptacle.

WARNING
Pull upward on the pressure relief handle to purge any pressure inside chamber (Refer to para 4.16).

(2) Remove all panels and top cover (Refer to para 4.2).

(3) Remove tubing (1, Figure 4-17) and elbow (2) from pressure relief valve (3).

(4) Remove pressure relief valve (3).

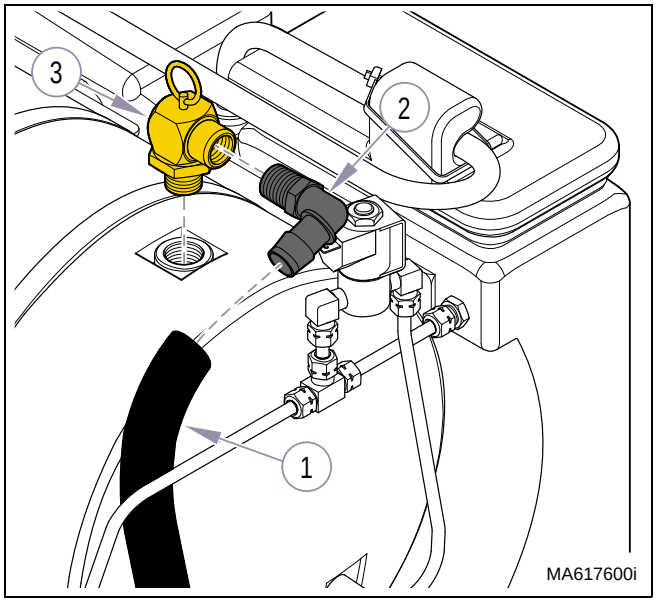

Figure 4-17. Pressure Relief Valve

B. Installation

EQUIPMENT ALERT
Use a pipe thread compound on the sterilizer fittings capable of withstanding the operating pressures and temperatures. Do *not* use a teflon tape as particles may migrate through system and cause blockage.

(1) Coat threads of pressure relief valve (3, Figure 4-26) with high temperature pipe thread compound (Loctite 565).

(2) Install pressure relief valve (3).

(3) Install elbow (2) on pressure relief valve (3).

(4) Install tubing (1) on elbow (2) and route tubing through tubing hole in bottom, back of base.

(5) Install L.H. panel and Top Cover (Refer to para. 4.2).

(6) Plug unit in, run a cycle to place pressure on lines and fittings, then check for leaks and operation of pressure relief valve (3).

(7) Install Back and R.H. side panel (Refer to para 4.2).

4.18 Vent or Fill Valve

A. Removal

(1) Unplug power cord from outlet receptacle.

(2) Remove R.H. side and back panel (Refer to para 4.2).

(3) Drain water from reservoir (Refer to para 4.6).

(4) Disconnect electrical wires from terminals of the Vent (1, Figure 4-18) or Fill (2) solenoid valve.

WARNING
Pull up on Pressure Relief Valve handle to purge any pressure inside chamber and lines before working on system.

(5) If removing Vent Valve (1) , disconnect compression fitting (3) and line on top of valve.

B. Disassembly

NOTE
The steps for disassembly and assembly of the Vent or Fill Valves are almost identical unless called out for the specific valve.

(1) On the Vent Valve, remove the reducer (1, Figure 4-19) and male connector (2) fittings.

(2) Remove nut (3), solenoid cover (4), and solenoid coil (5).

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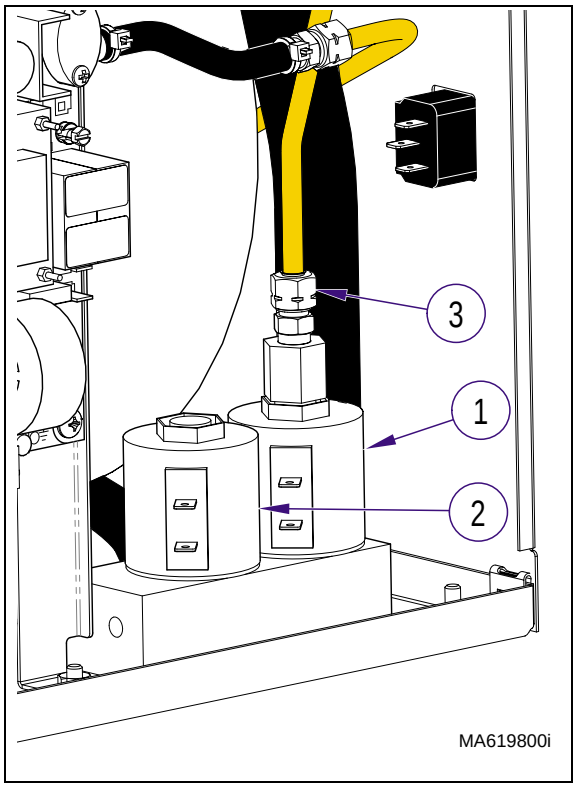

Figure 4-18. Vent / Fill Valves

(3) Using a 3/4" spanner wrench, remove the plunger housing (6), plunger (7) and o-ring seal (8).

C. Assembly

(1) Position the new o-ring (8, Figure 4-19) in the valve body, then install the new plunger (7) and plunger housing (6).

(2) Install the solenoid coil (5), cover (4), and nut (3).

NOTE
On the Vent Valve, replace the o-ring (9) located on the end of the reducer (1) before installing on plunger housing (6).

(3) On the Vent Valve, install the reducer (1) and male connector (2) fittings.

D. Installation

(1) Connect the compression fitting (3, Figure 4.18) on the Vent Valve.

(2) Refill reservoir with distilled or demineralized water (Refer to para 4.6).

(3) Plug unit in, run a cycle to place pressure on lines and fittings; then check for leaks.

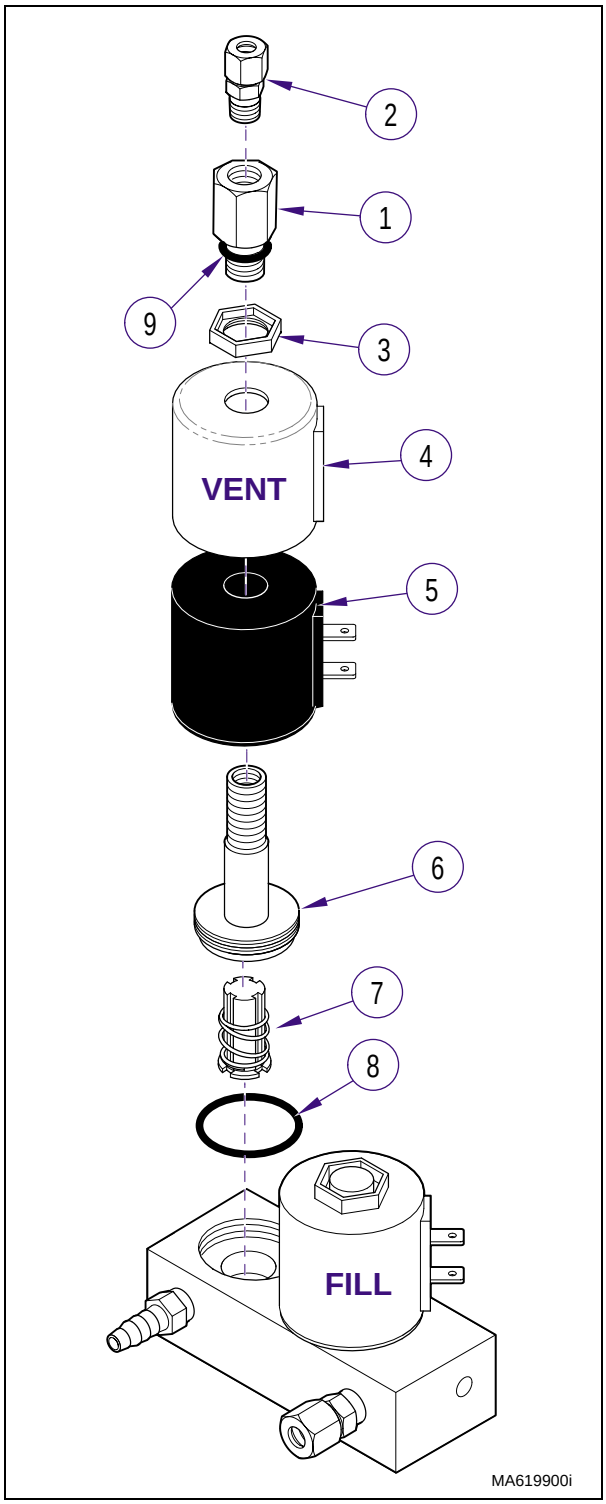

Figure 4-19. Vent / Fill Valves

(4) Run Service Diagnostics to check operation of Vent or Fill Solenoid Valve (2) (refer to Service Diagnostics [Vent or Fill Valve Test], Para 2.2).

(5) Install panels (Refer to para 4.2).

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4.19 Hi-Limit Thermostats

A. Removal

(1) Unplug power cord from outlet receptacle.

(2) Drain water from reservoir (Refer to para 4.6).

(3) Remove R.H. side panel (Refer to para 4.2).

(4) Remove trays and tray rack (Refer to para 4.5).

(5) Lay sterilizer over onto its left side.

(6) Remove base inspection cover (1, Figure 4-20).

(7) First tag, then disconnect the wires from the two hi-limit thermostats (2) and heating element (3).

(8) Remove the nuts (4), lockwashers (5), and brass washers (6) from the heating element.

(9) Remove the thermostat bracket (7) and hi-limit thermostats (2).

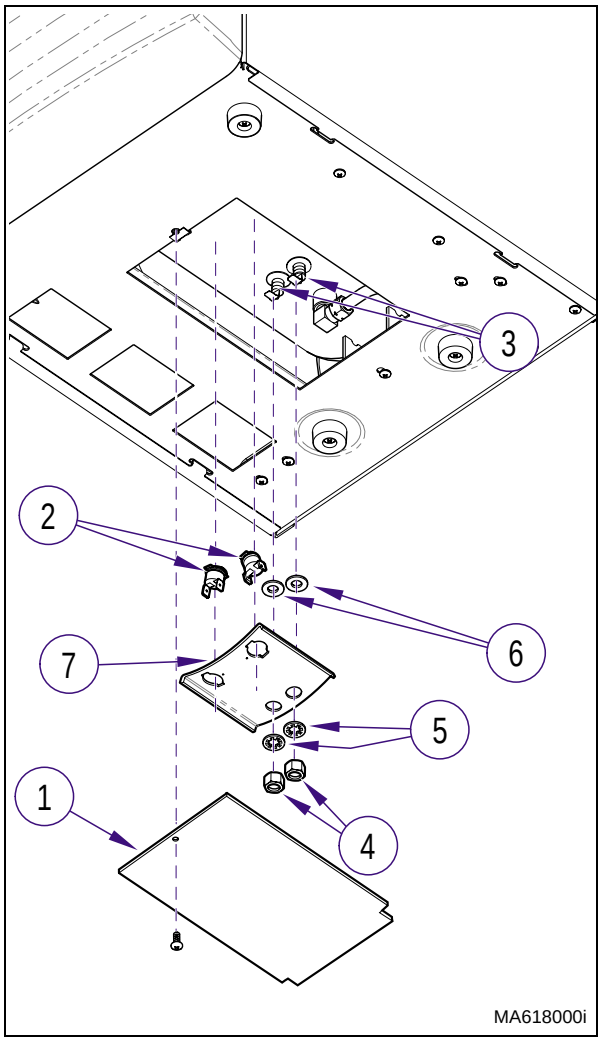

Figure 4-20. High Limit Thermostats

B. Installation

(1) Place the thermostat bracket (7, Figure 4-19) and hi-limit thermostats (2) in position.

EQUIPMENT ALERT
Before tightening the nuts that secure the heating element assure the wire spacer is in position beneath the heating element and the gaskets not damaged (Refer to para 4.20).

(2) Install the brass washers (6), lockwashers (5), and nuts (4) on the heating element (3).

(3) Connect the white jumper wire (1, Figure 4-20) between the two high limit thermostats (2).

(4) Connect the yellow lead (3) to one of the thermostats and the red lead (4) to the other.

(5) Connect the brown (5) and brown and white (6) leads to the terminals (7) of the heating element.

(6) Install base inspection cover (1, Figure 4-19) and set unit upright.

(7) Install trays and tray rack (Refer to para 4.5).

(8) Refill reservoir with distilled water (Refer to para 4.6).

(9) Run Service Diagnostics to check operation (refer to Service Diagnostics, Para 2.2).

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4.20 Heating Element

A. Removal

(1) Unplug Sterilizer from outlet.

(2) Remove trays and tray rack (refer to para 4.5).

(3) Remove R.H. and back panel (refer to para 4.2).

(4) Disconnect leads from terminals of heating element (1, Figure 4-21).

(5) Remove nuts (2), lockwashers (3), and brass washer (4).

(6) Disengage heating element (1) from hook bracket (A) inside chamber and remove heating element (1) and spacer (5).

B. Installation

EQUIPMENT ALERT
Spacer must be in position beneath heating element.

(1) Install heater gaskets (6, Figure 4-22) on ends of heating element (2) and install spacer (5) and heating element (1) in chamber.

EQUIPMENT ALERT
The torque applied to heating element nuts should not exceed 25 ft./lbs. (34 N•M).

(2) Install brass washers (4), lockwashers (3), and nuts (2) on ends of heating element (2) and tighten. *Do not exceed maximum torque.*

(3) Connect electrical leads (1).

(4) Install tray rack and trays (refer to Para 4.5).

(5) Run Service Diagnostics to check operation and for leaks (refer to Service Diagnostics, Para 2.2).

(6) Install panels (Refer to para. 4.2).

(7) Plug unit into electrical outlet.

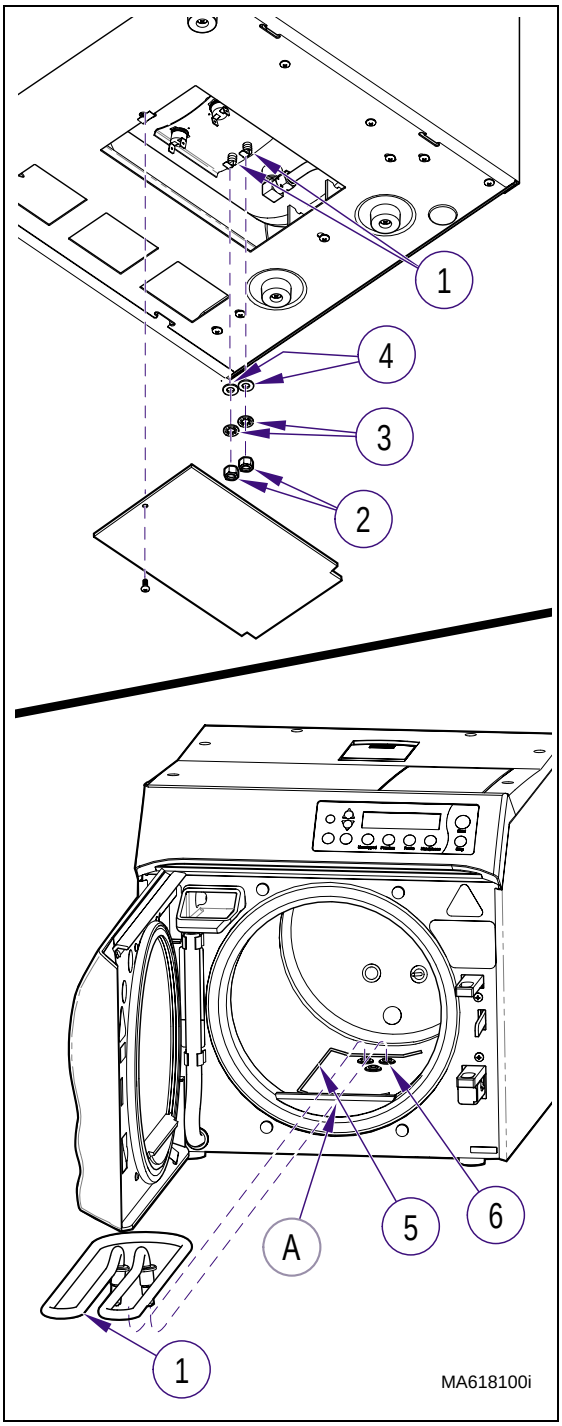

Figure 4-21. Heating Element

4.21 Water Level Sensor

A. Removal

(1) Unplug the sterilizer from the outlet.

(2) Remove the right side and back panels (refer to Para 4.2).

(3) Open the door and remove the trays and tray rack (refer to para 4.5).

(4) Disconnect the red lead (1, Figure 4-23) from the water level sensor.

(5) Remove the nut (2) and terminal (3).

(6) Remove the compression nut (4).

(7) Push the level sensor (5) thru the chamber wall to the inside of the chamber and remove the sensor and spacer (6).

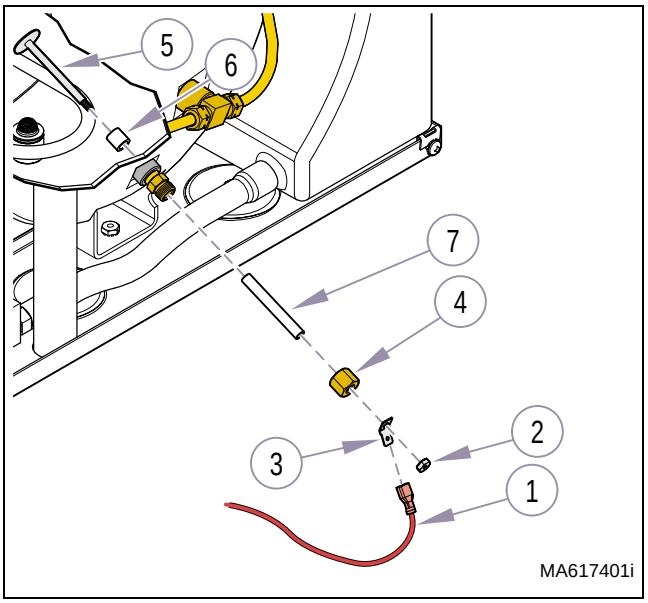

Figure 4-23. Water Level Sensor

B. Installation

(1) Install the teflon tube (7, Figure 4-23) and spacer (6) on the level sensor (5) and, insert from inside chamber, thru the chamber wall.

EQUIPMENT ALERT
Do **not** over-tighten compression fitting or the ferrule could cut through the teflon sleeve resulting in the sensor shorting out. Tighten *1 1/4 turns* from finger tight.

(2) Install compression nut (4). *Do **not** over-tighten*. Tighten 1 1/4 turns from finger tight and then install terminal (3) and nut (2).

EQUIPMENT ALERT
Before installing electrical leads, use an ohmmeter and check to assure sensor is not grounded to chamber. No continuity reading should be present.

(3) Check to assure the sensor is not grounded against the chamber using an ohmmeter. Place one probe on the sensor terminal (1, Figure 4-24) and the other on the chamber wall (2). No reading should be present.

(4) Connect the electrical lead (3) to the sensor terminal (4).

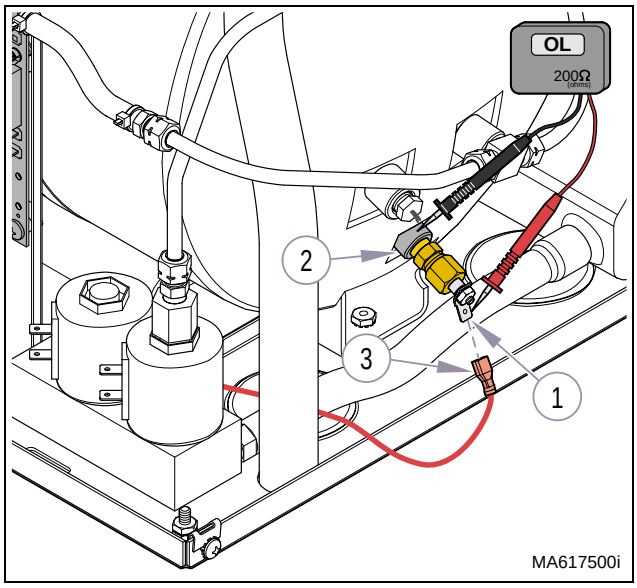

Figure 4-24. Water Level Sensor

(5) Run Service Diagnostics to check operation and for leaks (refer to Service Diagnostics, Para 2.2).

(6) Install panels (refer to Para 4.2).

4.22 Reservoir

A. Removal

(1) Unplug the sterilizer from the outlet.

(2) Drain the reservoir (refer to Para 4.6).

(3) Remove the top cover and panels (refer to para. 4.2).

(4) Disconnect the tubing (1,Figure 4-25) at top of reservoir (2) that goes to the Air Valve .

(5) Disconnect tubing (3) at bottom of reservoir that goes to the Fill Valve.

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(6) Pull the level indicator / drain tube (4) loose from the hose clips (5).

(7) Remove the two mounting bolts (6) and remove the reservoir (2).

B. Disassembly

(1) Cut the cable tie (1, Figure 4-26) and remove the equalization tube (2).

(2) Slide off the reservoir lid (3) and remove the tank seal (4)

(3) Disconnect condensing coil (5) and remove it.

C. Assembly

(1) Place condensing coil (5, Figure 4-26) in position and connect fittings.

(2) Install the tank seal (4) and slide on the reservoir lid (3).

(3) Place the equalization tube (2) in position on the bracket (A) and insert ends into grommets (B) in top of reservoir.

(4) Install the cable tie (1).

D. Installation

(1) Place the reservoir (2, Figure 4-25) in position and secure to base with two screws (6).

(2) Connect the Fill Valve tubing (3), and Air Valve tubing (1) to the reservoir (2).

(3) Position the level indicator / drain tube (4) into the hose clips (5).

(4) Pour distilled water in the reservoir.

(5) Install the back panel (Refer to para. 4.2).

(6) Plug unit into electrical outlet, run a cycle, and check for leaks.

(7) Install remaining panels (Refer to para 4.2).

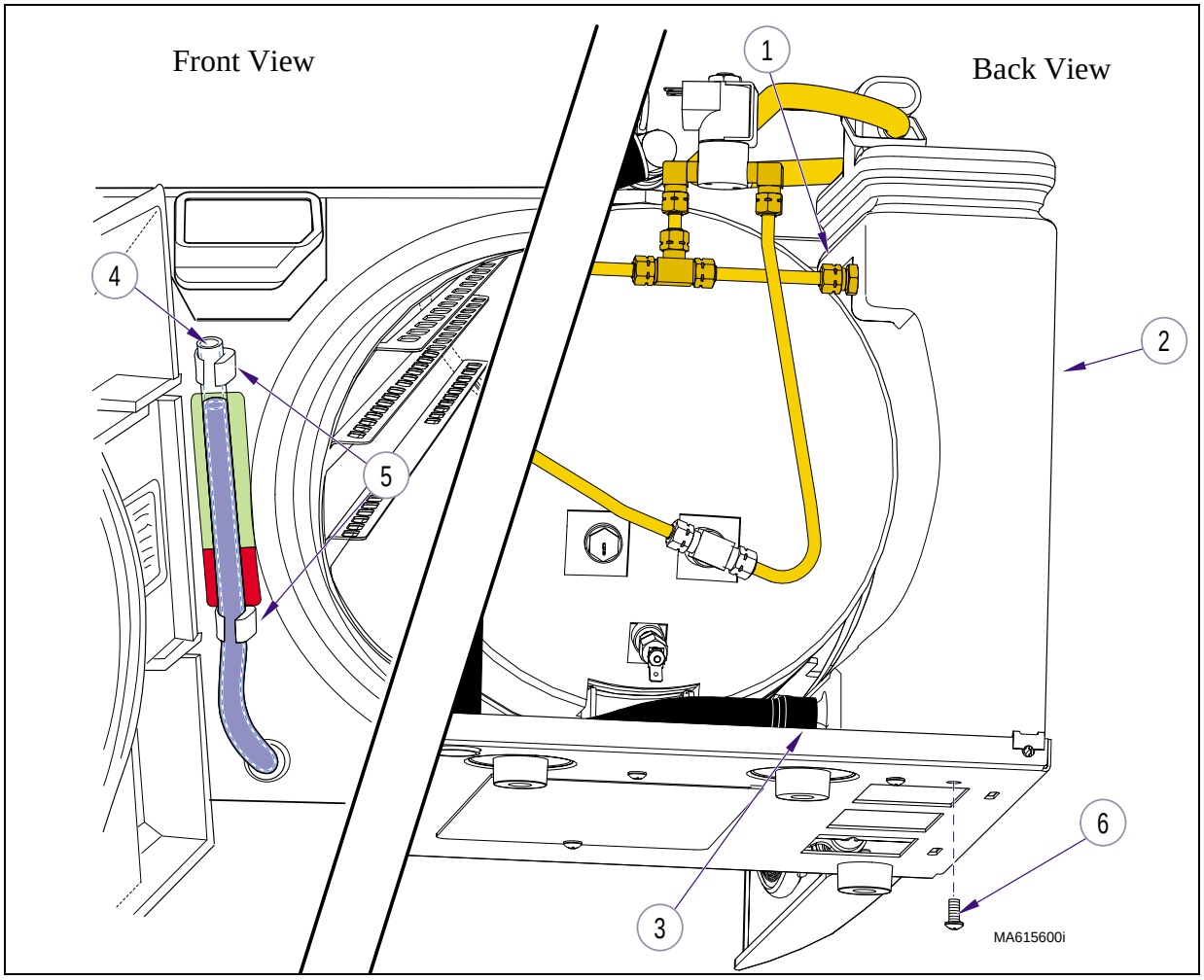

Figure 4-25. Reservoir

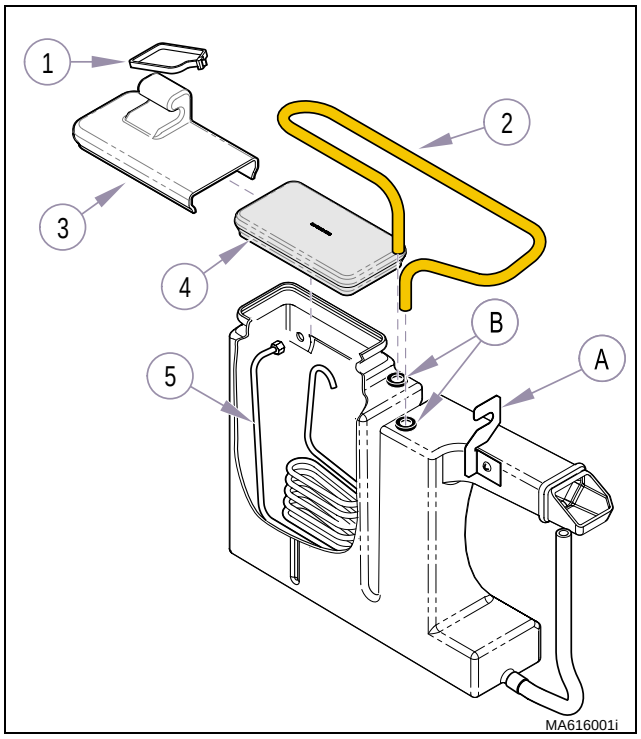

Figure 4-26. Reservoir

4.23 Printer

A. Removal

(1) Unplug the sterilizer from the outlet.

(2) Remove the right side panel (refer to Para 4.2).

(3) Disconnect printer wire harness (1, Fig 4-27) from the plug connector J14 on P.C. Board (2).

(4) Carefully lift printer assembly (3) from top cover (4) while pulling the printer wire harness (1) out thru the slot (A) of top cover.

(5) Slightly bend sides of printer assembly (3) outward until printer housing (5) can be pulled off locking tabs (B).

NOTE
Should it be necessary to install a new paper roll, cartridge ribbon, or perform maintenance on the printer, refer to the M9 / M11 Sterilizer Installation / Operation Manual.

B. Installation

(1) Insert printer housing locking tabs (B, Figure 4-27) into slots of printer assembly (3).

(2) Route the printer wire harness (1) thru the slot (A) of top cover (4).

(3) Connect the printer wire harness (1) to the plug connector J8 on P.C. Board (2).

(4) Place printer in position on top cover (4).

(5) Install right side panel (refer to Para 4.2).

(6) Plug unit into outlet.

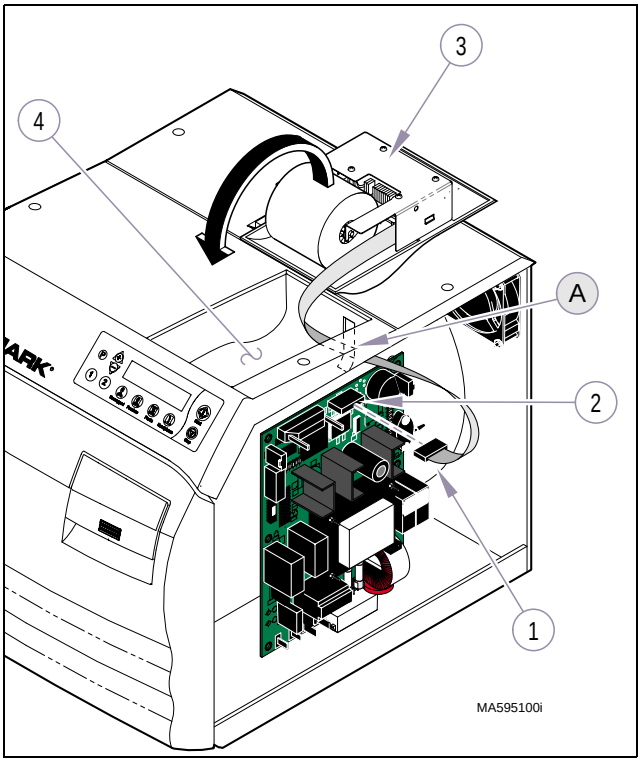

Figure 4-27. Printer

4.24 Pressure Gauge Test Harness.

NOTE
In order to check system pressure a Pressure Gauge Harness is available (002-0372-00). The following instructions pertain to connecting and disconnecting the Pressure Gauge.

WARNING
Always assure power is disconnected and there is no pressure in the system before attempting to connect or disconnect the Pressure Gauge.

A. Connecting Pressure Gauge

(1) Cut cable tie and disconnect the tube (1, Figure 4-28) from pressure transducer (2).

(2) Connect tube of Pressure Gauge Test Harness to pressure transducer (2).

(3) Connect tube (1) to fitting of Pressure Gauge Test Harness.

B. Disconnecting Pressure Gauge Test Harness.

(1) Disconnect tube (1, Figure 4-28) from fitting of Pressure Gauge Test Harness.

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(2) Disconnect tube of Pressure Gauge Test Harness from pressure transducer (2)

EQUIPMENT ALERT
Use a High Temperature cable tie when securing tube (1) to pressure transducer. (Refer to Section 6, Parts List, for correct part number).

(3) Connect tube (1) to pressure transducer (2) and secure with high temperature cable tie.

(4) Run unit and check for leaks, then install panel(s).

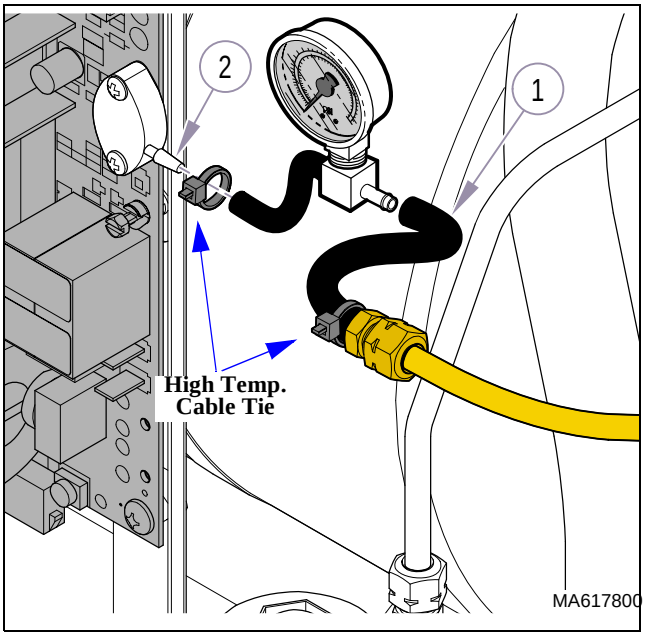


Figure 4-28. Pressure Gauge Test Harness

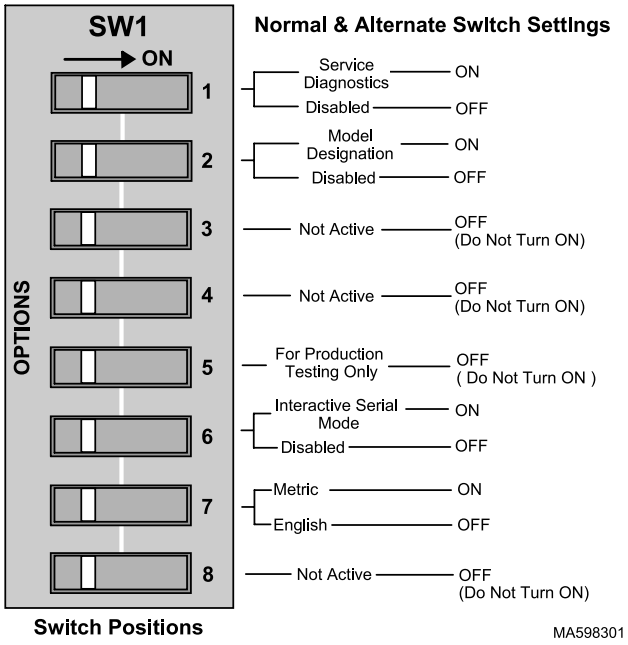
SECTION V
SCHEMATICS AND DIAGRAMS

5.1 SW1 Dip Switch Settings.

Switch	Position	Result
#1	OFF	Disabled
	ON	**Service Diagnostics** Allows Technician to: **a.) Turn ON / OFF all Outputs.** **b.) Verify Keypad functions.** **c.) Monitor Steam and Auxiliary Temperature readings.**
#2	OFF	Disabled
	ON	**Enter Model Designation (M9, M11, M9D, M11D) to Configure Software.**
#3	OFF	**Not Active (Do not turn ON) No effect on software.**
	ON	
#4	OFF	**Not Active (Do not turn ON) No effect on software.**
	ON	
#5	OFF	Disabled
	ON	***Do Not Use***. Factory Test Mode. Unusable in Field
#6	OFF	Disabled
	ON	**Interactive Serial Mode** (Allows communciation thru a RS-232 interface connection to P.C. Board).
#7	OFF	**Displays English** (Temperature in °F, Pressure in PSI)
	ON	**Displays Metric** (Temperature in °C, Pressure in kPa)
#8	OFF	**Not Active (Do not turn ON) No effect on software.**
	ON	

NOTE:
For Switches # 1 thru # 6:
LOWER numbered switches take precedence over **HIGHER** numbered when **BOTH** switches are **ON**.
Example: If both Switch # 1 (Diagnostics) & Switch # 4 Atmospheric Pressure Entry were ON, Switch # 1 would take priority over # 4.

SW1 Dip Switch Assembly is located on left side of Main P.C. Board.



SECTION V
SCHEMATICS AND DIAGRAMS

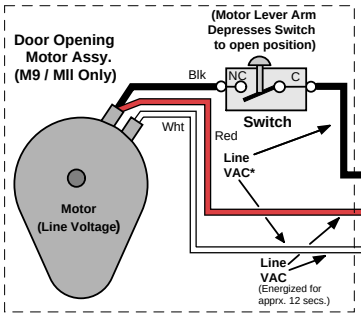
Test Points (TP)

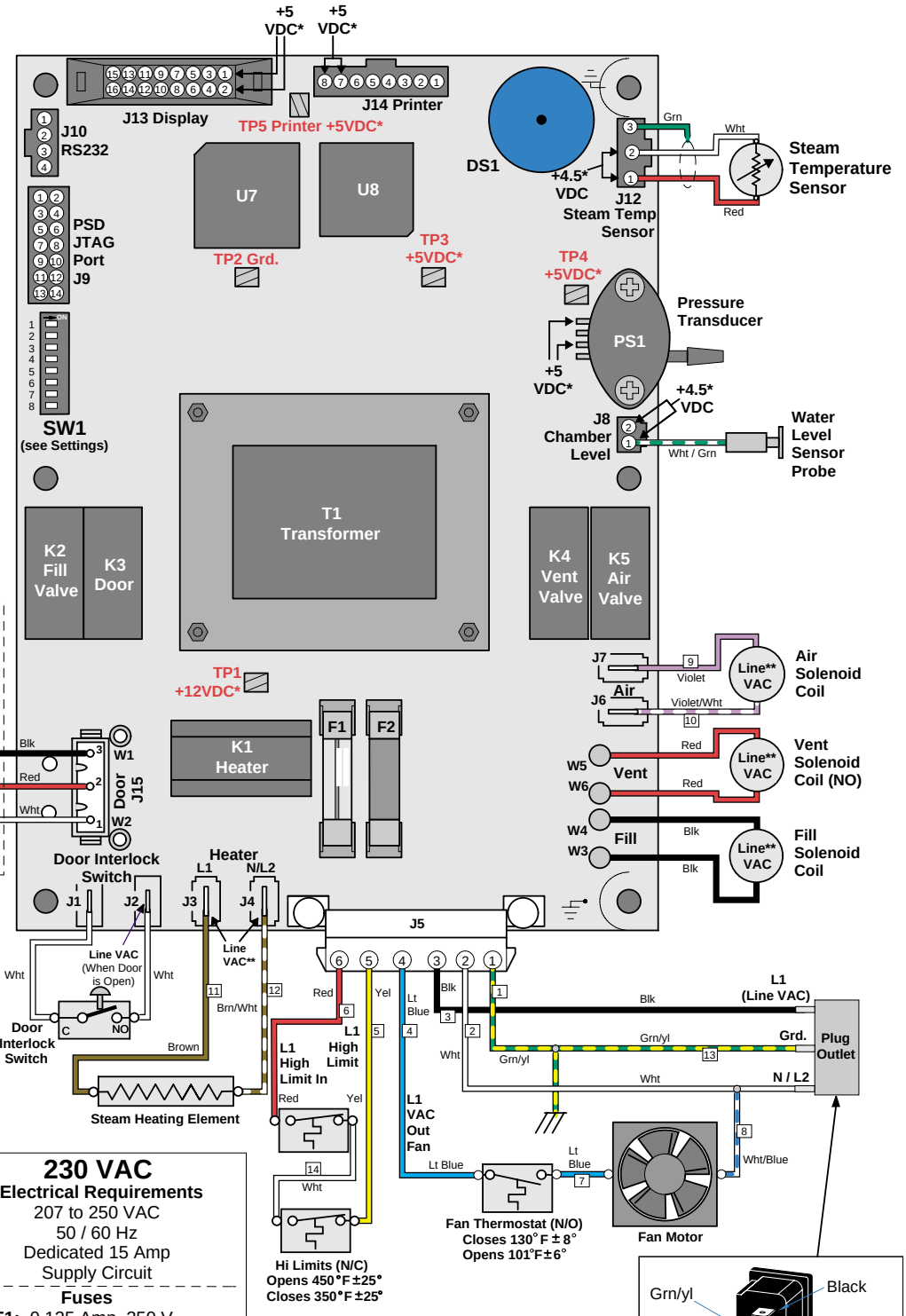
TP2 - TP1 12 VDC supply to K1 - K5 relay coils.
TP2 - TP3 5 VDC supply to low voltage circuit components.
TP2 - TP4 5 VDC supply to Temp. & Pressure Sensors.
TP2 - TP5 5 VDC supply to Printer.

SW1 Settings

Switch	
1	On for Service Diagnostics
2	On for Model Designation
3, 4, 5	Not Used, leave Off
6	On for Communication Port hook-up to computer.
7	Off-English, On-Metric
8	Not Used, Leave Off

* Constant Voltage
** Voltage Present Only During Component Operation
Note: Disconnect plug connector when checking voltage.





M9, M9D, M11, M11D
Sterilizer
Main P.C. Board
115 & 230 VAC
Single Phase 50 / 60 Hz

115 VAC

Electrical Requirements
104 to 127 VAC
50 / 60 Hz
Dedicated 15 Amp
Supply Circuit

Fuses
F1: 0.250 Amp, 250 V. Slow Blow, 1/4"x1 1/4"
F2: 15 Amp, 250 V. Fast Acting, 1/4"x1 1/4"

Resistances (Ohms) Cold (+ / - 10%)

Door Opening Motor (+/- 7.5%)	9316	Ohms
Fill Solenoid	0.4	M ohms
Air Solenoid	0.4	M ohms
Vent Solenoid	0.4	M ohms
Heating Element	10	Ohms

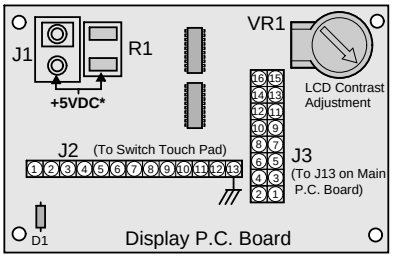
230 VAC

Electrical Requirements
207 to 250 VAC
50 / 60 Hz
Dedicated 15 Amp
Supply Circuit

Fuses
F1: 0.125 Amp, 250 V. Slow Blow, 5 x 20mm
F2: 8 Amp, 250 V. Fast Acting, 5 x 20mm

Resistances (Ohms) Cold (+ / - 10%)

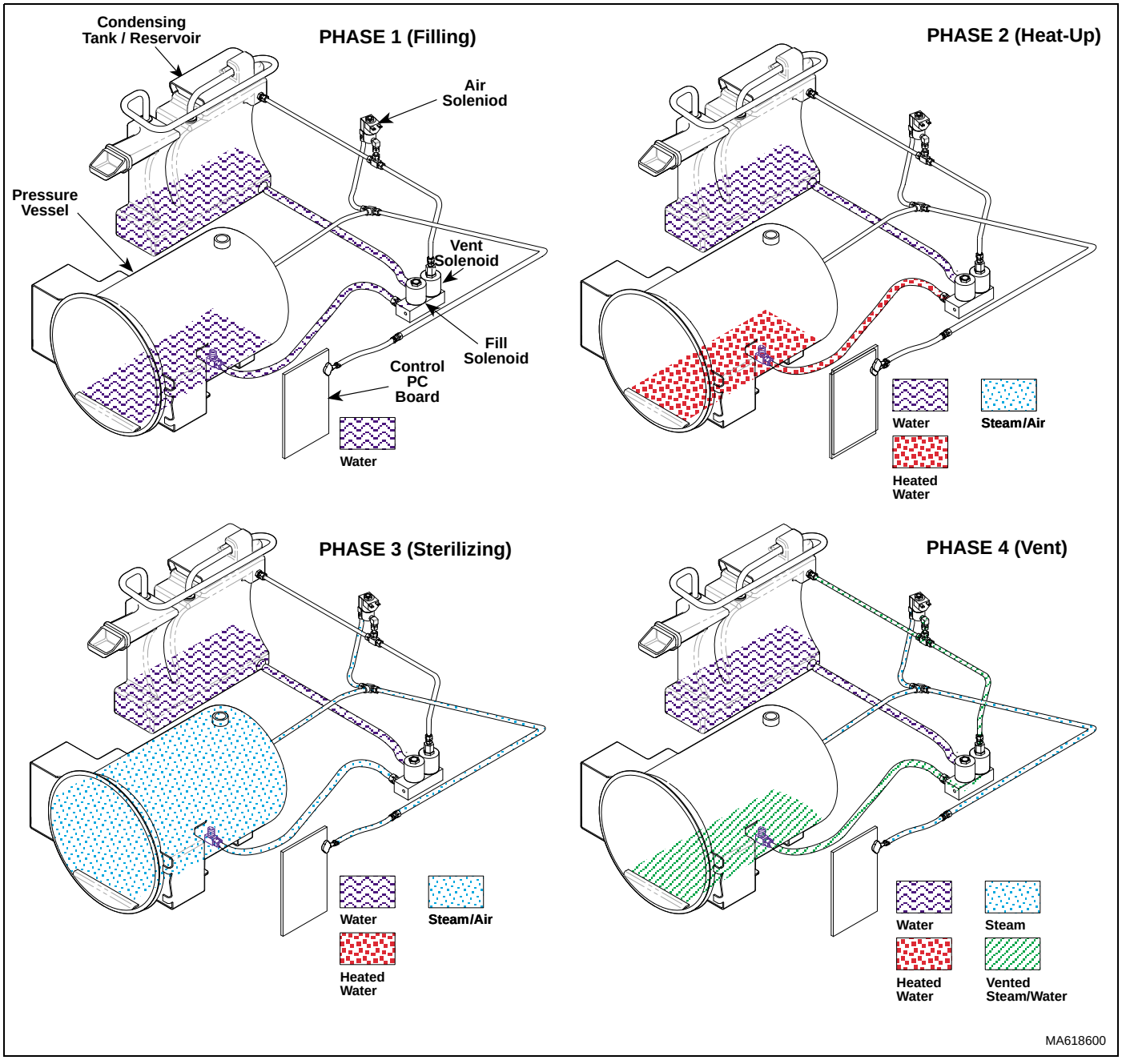
Door Opening Motor (+/- 7.5%)	14,900	Ohms
Fill Solenoid	3.6	M ohms
Air Solenoid	3.5	M ohms
Vent Solenoid	3.2	M ohms
Heating Element	38	Ohms



MA612400

5.2 Flow Diagram

The Flow Diagram illustrates the water, heated water, steam, and vented steam / water flow through the Sterilizer during the Fill, Heat-Up, Sterilizing, and Vent Modes during a complete operation.



SECTION V
SCHEMATICS AND DIAGRAMS

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SECTION VI
PARTS LIST

6.1 Description of Bullets

If a component has a bullet [•] in the Part No. column and the Description column, it is a subcomponent of an assembly in the parts list.

6.2 Torque Specifications and Important Assembly Notes

Required torque specifications, measurements, and procedures will be noted on the parts illustrations. Adherence to these requirements is essen-

Attention

The Parts Lists in this manual are separated as shown below. Verify Model Number, then refer to appropriate pages.

M9 / M9D..... Pages 6-2 thru 6-12

M11 / M11D..... Pages 6-14 thru 6-24

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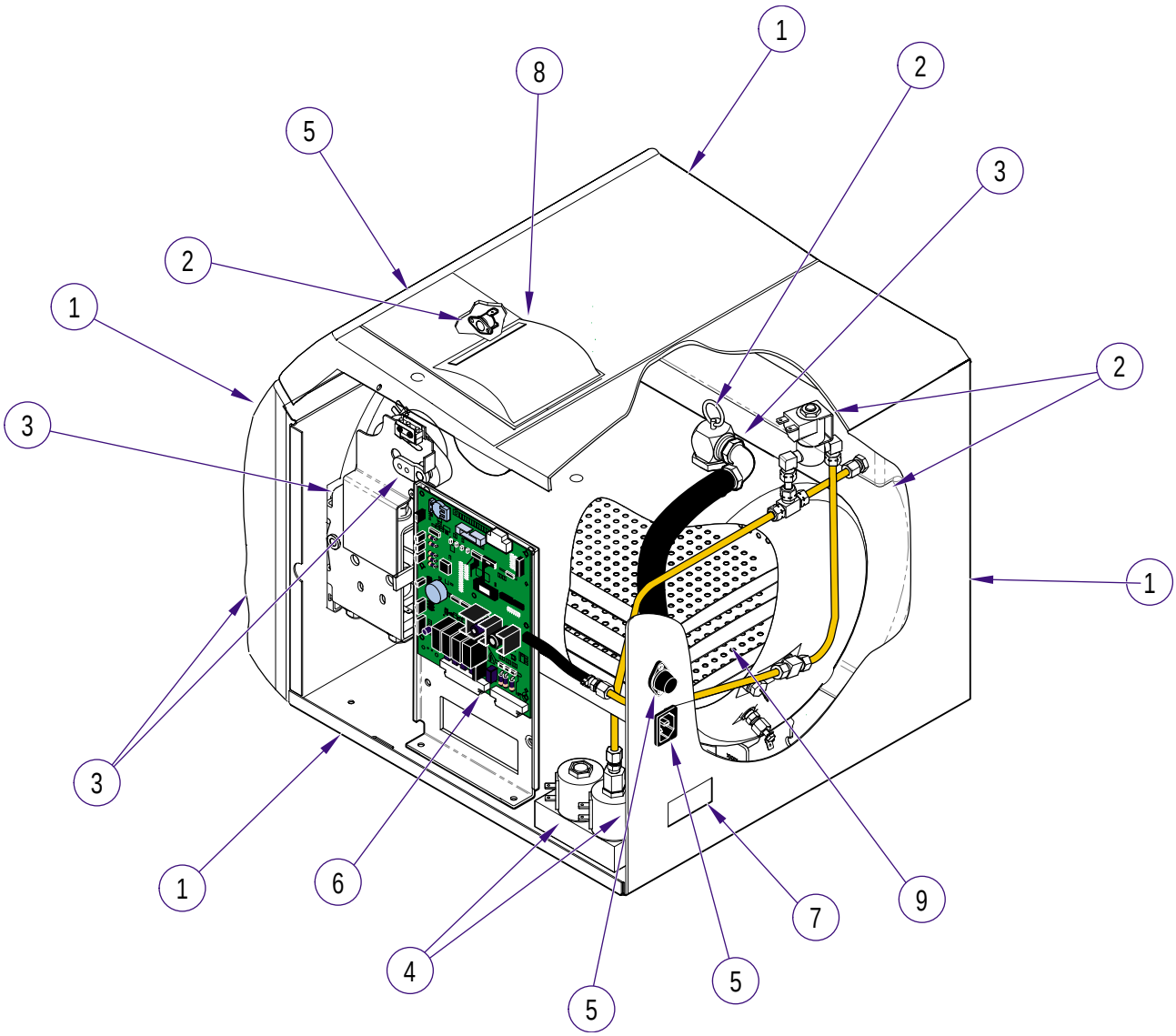
Pictorial Index



MA593700i

Item	Part No.	Description	Qty
	M9-020	Midmark M9 Ultraclave (115 VAC [Serial Number Prefix “RN”])	6-2
	M9-021	Midmark M9 Ultraclave (230 VAC [Serial Number Prefix “RP”])	6-2
	M9-022	Ritter M9 Ultraclave (115 VAC [Serial Number Prefix “RR”])	6-2
	M9D-020	Midmark M9 Ultraclave (115 VAC [Serial Number Prefix “RW”])	6-2
	M9D-022	Midmark M9 Ultraclave (230 VAC [Serial Number Prefix “RX”])	6-2

Item	Part No.	Description	Qty
1		Main Enclosures	6-3
2		Plumbing and Sensors	6-4
3		Pressure Vessel Components	6-5
4		Manifold Components	6-6
5		Electrical Components	6-7
6		Control PC Board	6-8
7		Labels and Decals	6-9
8		Printer Components (Not Shown)	6-10
9		Racks, Trays, and Cleaner	6-11
10		Packaging	6-12

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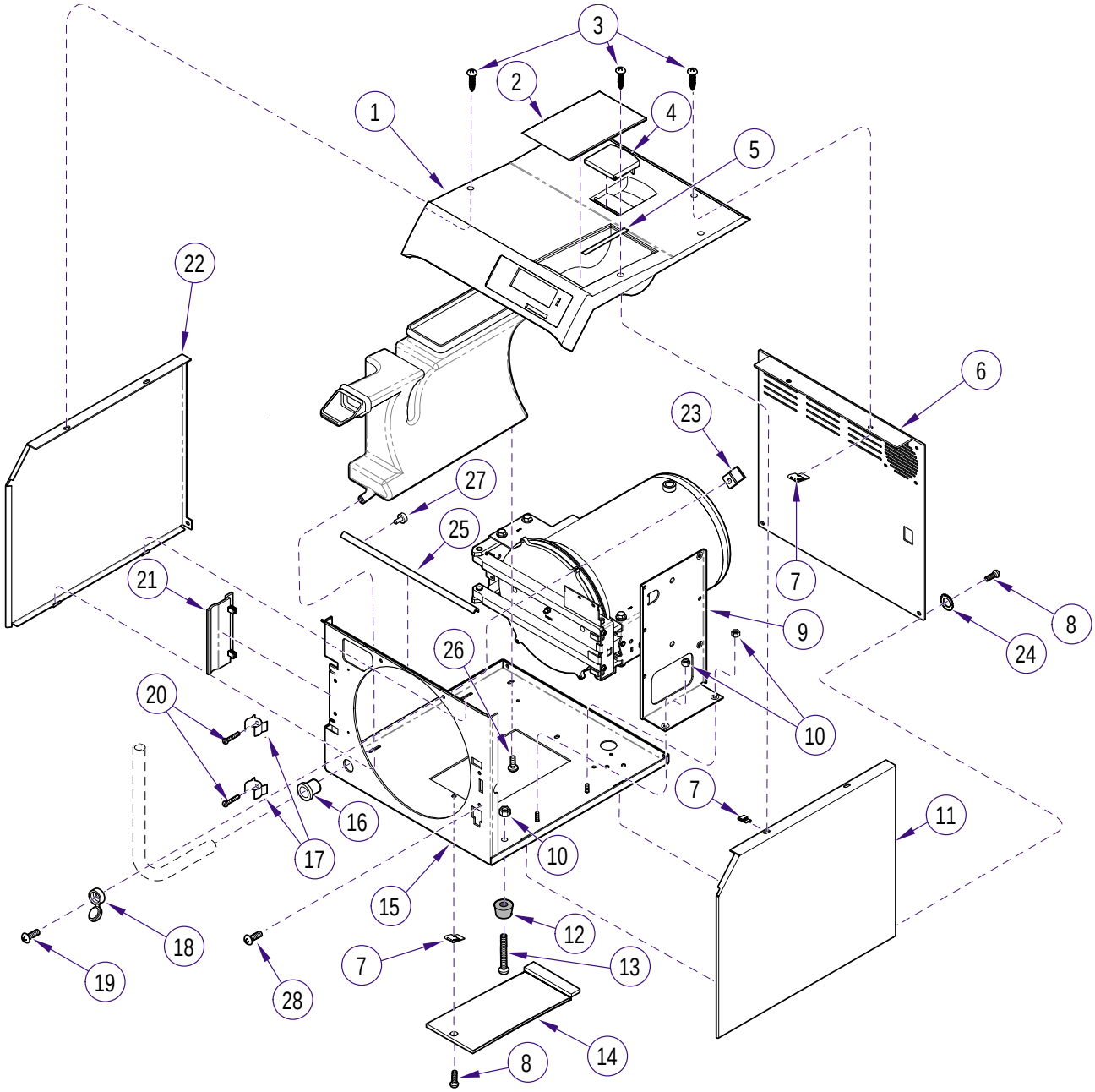
Main Enclosures



MA593400i

Item	Part No.	Description	Qty
1	053-1250-00	Top Cover (Midmark)	1
	053-1250-01	Top Cover (Ritter)	1
2	053-0933-00	Cover Plate - Printer	1
3	040-0010-88	Screw	6
4	053-1252-00	Pressure Relief Handle	1
5	042-0204-01	Adhesive Strips	3
6	050-5226-10	Back Panel	1
7	H352623	Tinnerman Nut	9
8	040-0010-125	Screw	3
9		PC Bracket (Refer to “Control PC Board” Elsewhere)	1
10	041-0010-04	Nut	10
11	050-5209-10	Side Panel	1
12	016-0523-03	Leveling Foot	4
13	040-0010-137	Leveling Screw	4
14	050-4326-00	Base Inspection Cover	1
15	029-3124-00	Base Panel (M9)	1
	029-3124-01	Base Panel (M9D)	1
16	053-0068-11	Strain Relief Bushing	1
17	053-0388-01	Hose Clip	2
18	053-0723-00	Screw Cover	4
19	040-0010-124	Screw	2
20	042-0010-21	Pop Rivet	2
21	053-1277-00	Hinge Cover	1
22	050-5208-10	Side Panel	1
23	050-4750-00	Flange Clamp	4
24	045-0001-31	Lock Washer	1
25	053-1370-01	Steam Block	1
26	040-0010-74	Screw	4
27	042-0182-00	Snap Clip	4
28	040-0010-95	Screw	4

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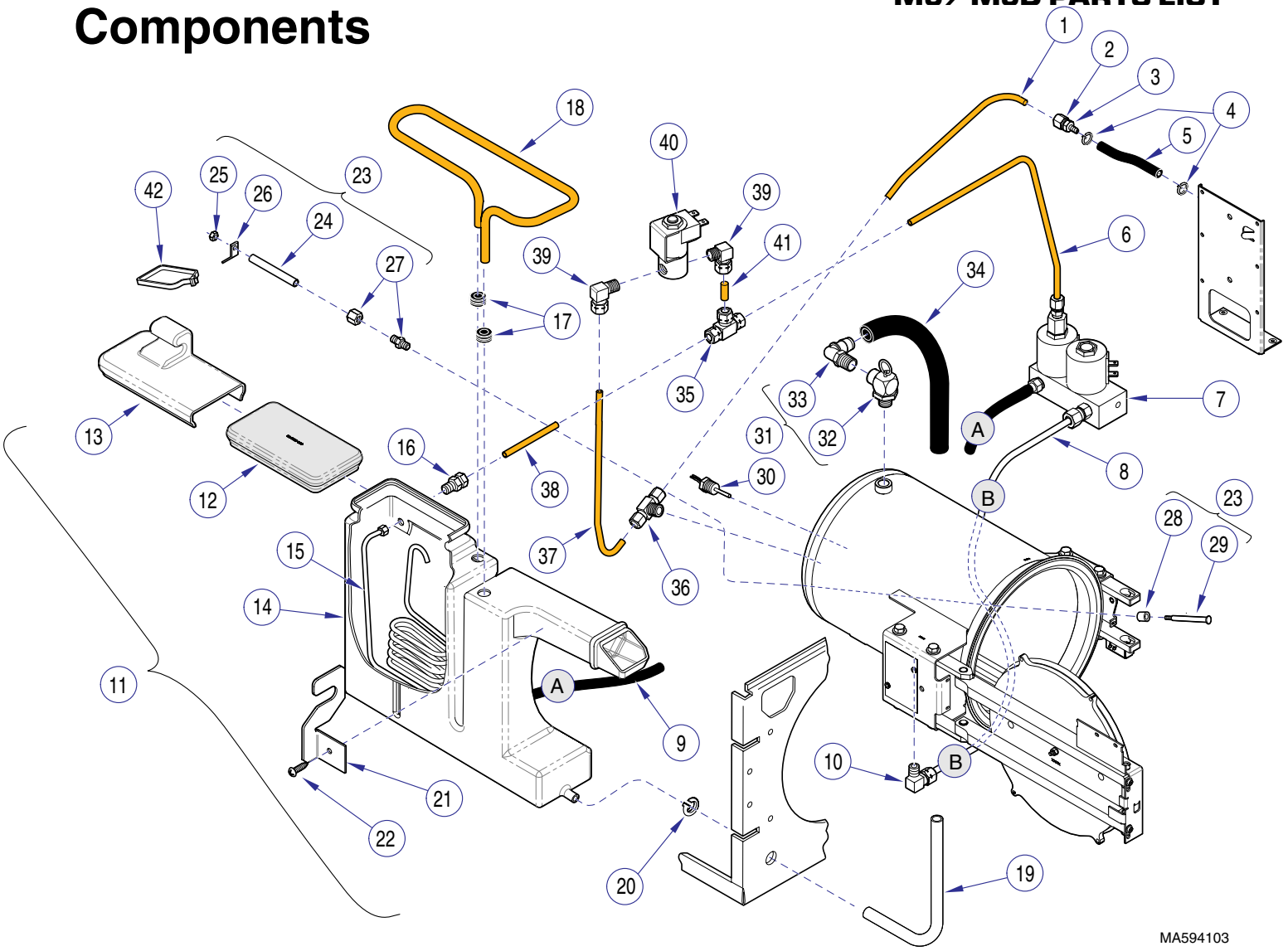
Plumbing and Sensor Components



MA594103

Item	Part No.	Description	Qty
1	• 014-0412-00	• PCB Pressure Sensor Tube	1
2	• 014-0192-00	• Compression Nut	1
3	• 014-0217-00	• Compression Connector	1
4	• 015-0013-05	• Cable Tie (High Temp)	2
5	• 053-0404-05	• Tube PCB Connector	1
6	014-0410-00	Tube	1
7		Manifold (Refer to “Manifold Components”)	6-6
8	014-0370-00	Tube	1
9	053-1033-04	Tube	1
10	014-0184-01	Male 90° Elbow	1
11	029-2753-00	Reservoir Tank Assembly(Includes Items 13 thru 21	
12	• 053-1303-00	• Reservoir Tank Seal	1
13	• 053-1257-02	• Reservoir Lid	1
14	• 053-1257-01	• Reservoir Tank	1
15	• 014-0421-00	• Condensing Coil Tube	1
16	• 014-0216-00	• Bulkhead Fitting	1
17	• 053-0394-03	• Grommet	2
18	• 014-0426-00	• Equalization Tube	1
19	• 053-0391-06	• Sight/Drain Tube	1
20	• 016-0748-01	• Hose Clamp	1
21	• 050-5684-00	• Equalization Coil Bracket	1

Item	Part No.	Description	Qty
22	• 040-0010-75	• Screw	1
23	002-0358-00	Level Sensor Tube Kit	
24	• 053-0390-01	• Tube	1
25	• 041-0006-02	• Nut	1
26	• 015-0595-00	• Terminal	1
27	• 014-0183-01	• Compression Nut	1
28	• 053-0407-00	• Spacer	1
29	• 030-0858-00	• Level Sensor Assembly	1
30	015-1680-00	Temperature Probe Assembly	1
31	002-0359-01	Pressure Relief Valve Kit(Includes Items 33 thru 34)	
32	• 014-0195-03	• Pressure Relief Valve	1
33	• 014-0258-00	• Male Elbow	1
34	053-0613-04	Neoprene Tubing	1
35	014-0423-00	Union Tee	1
36	014-0202-03	Male Branch Tee	1
37	014-0409-00	Tube	1
38	014-0411-00	Tube	1
39	014-0184-00	Elbow	2
40	014-0419-00	Solenoid (115 volt)	1
	014-0419-01	Solenoid (230 volt)	1
41	014-0424-00	Tube	1
42	015-0013-03	Wire Tie	1

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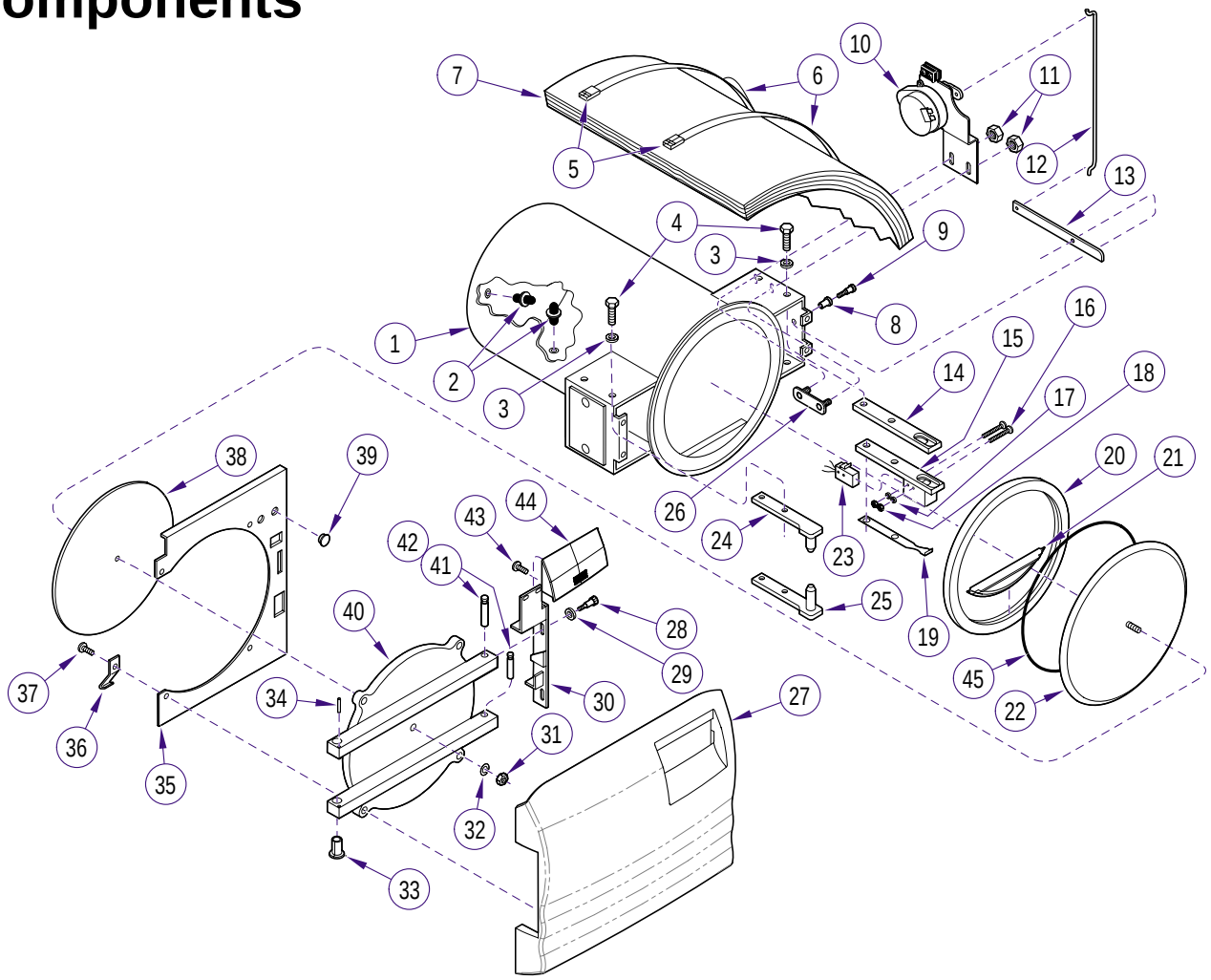
Pressure Vessel Components



MA594203i

Item	Part No.	Description	Qty
1		Chamber	1
2	002-0360-00	Filter	2
3		Washer	8
4		Screw	8
5	H99387	Aluminum Seal	2
6	H99388-36	Insulation Strap	2
7	053-1260-00	Insulation Wrapper	1
	Items #8 thru #13 refer to M9 units only.		
8	045-0000-04	Brass Washer	2
9	042-0106-01	Shoulder Screw (Apply Valve Lubricant #064-0002-00])	2
10		Door Opening Motor Assembly(Refer to "Electrical Components Elsewhere")	6-7
11	041-0010-04	Nuts	2
12	057-0755-00	Motor Connecting Rod	1
13	050-5669-00	Latch Lever	1
14		Right Bracket	1
15		Switch Weldment	1
16	040-0002-08	Screw	2
17	045-0001-80	Washer	2
18	041-0002-01	Nut	2
19	050-5245-01	Switch Spring Arm	1
20	053-0366-00	Door Gasket (Incl. in 002-0361-01 Kit)	1
21	053-0903-00	Dam Gasket (Incl. in 002-0361-01 Kit)	1

Item	Part No.	Description	Qty
22	030-1016-00	Housing	1
23		Door Switch (Refer to "Electrical Components" Page 6-7, Elsewhere)	1
24		Top Bracket	1
25		Bottom Bracket	1
26	029-3055-00	Stud Plate	1
27	053-1251-00	M9 Door Panel	1
	053-1251-01	M9D Door Panel	1
28	042-0106-00	Shoulder Screw	2
29	045-0000-04	Washer	2
30	050-5225-01	Latch	1
31	041-0000-00	Nut	1
32	045-0000-00	Lockwasher	1
33		Flange Bearing	2
34	042-0104-00	Roll Pin	1
35	050-5210-00	Inside Door Cover	1
36	050-2347-00	Door Spring	1
37	040-0008-50	Screw	4
38	016-0395-01	Door Insulation Pad	1
39	053-0050-00	Plug	2
40		Door	1
41		Door Bolt 5669	2
42	064-0014-00	Grease	AR
43	040-0010-75	Screw	2
44	053-1253-00	Door Handle	1

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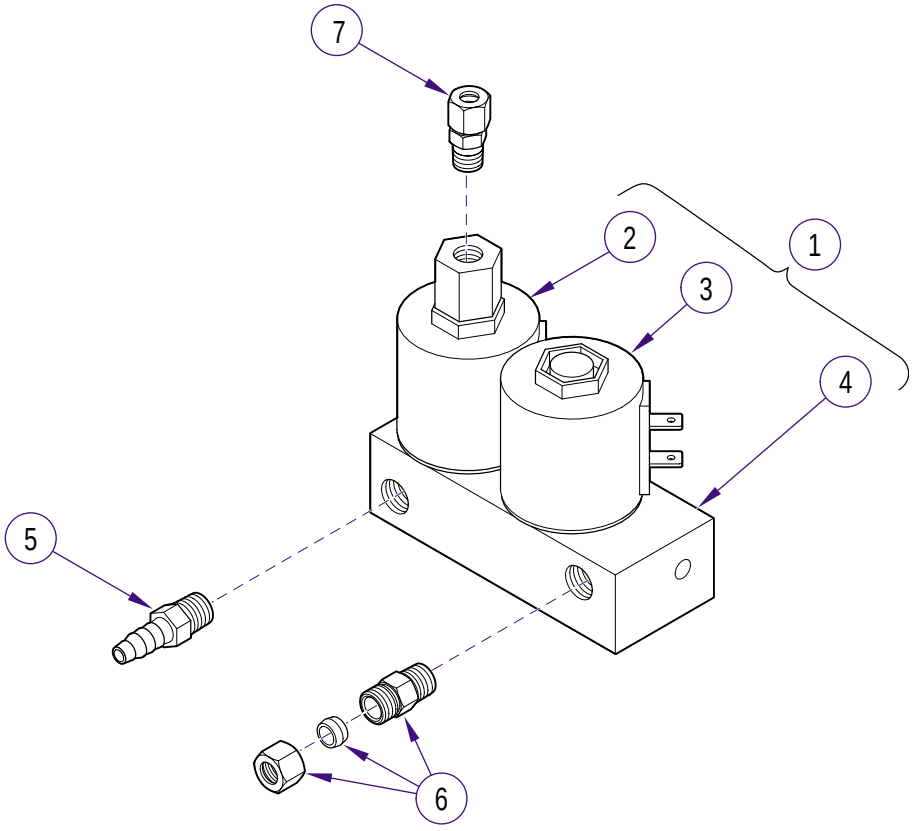

MA606000i

Item	Part No.	Description	Qty
	029-2755-00	Manifold Assembly(115 volt)	
	029-2755-01	Manifold Assembly(230 volt)	
1	• 014-0420-00	• Solenoid Valve Manifold (115 volt)	1
	• 014-0420-01	• Solenoid Valve Manifold (230 volt)	1
2	• • 014-0275-00	• • Solenoid Valve (Vent) (115 volt)	1
	• • 014-0275-01	• • Solenoid Valve (Vent) (230 volt)	1
	• • • 014-0236-11	• • • Replacement Plunger (not shown)	1
•	• • 014-0236-10	• • • Coil (115 volt not shown)	1
3	• • 014-0236-00	• • Solenoid Valve (Fill) (115 volt)	1
	• • 014-0236-01	• • Solenoid Valve (Fill) (230 volt)	1
	• • • 014-0236-11	• • • Replacement Plunger (not shown)	1
	• • • 014-0236-10	• • • Coil (115 volt not shown)	1
4	•	• Manifold Block	1
5	• 014-0347-00	• Barb Fitting	1
6	• 014-0183-01	• 1/4 Fitting	1
7	• 014-0183-02	• 3/8 Fitting	1

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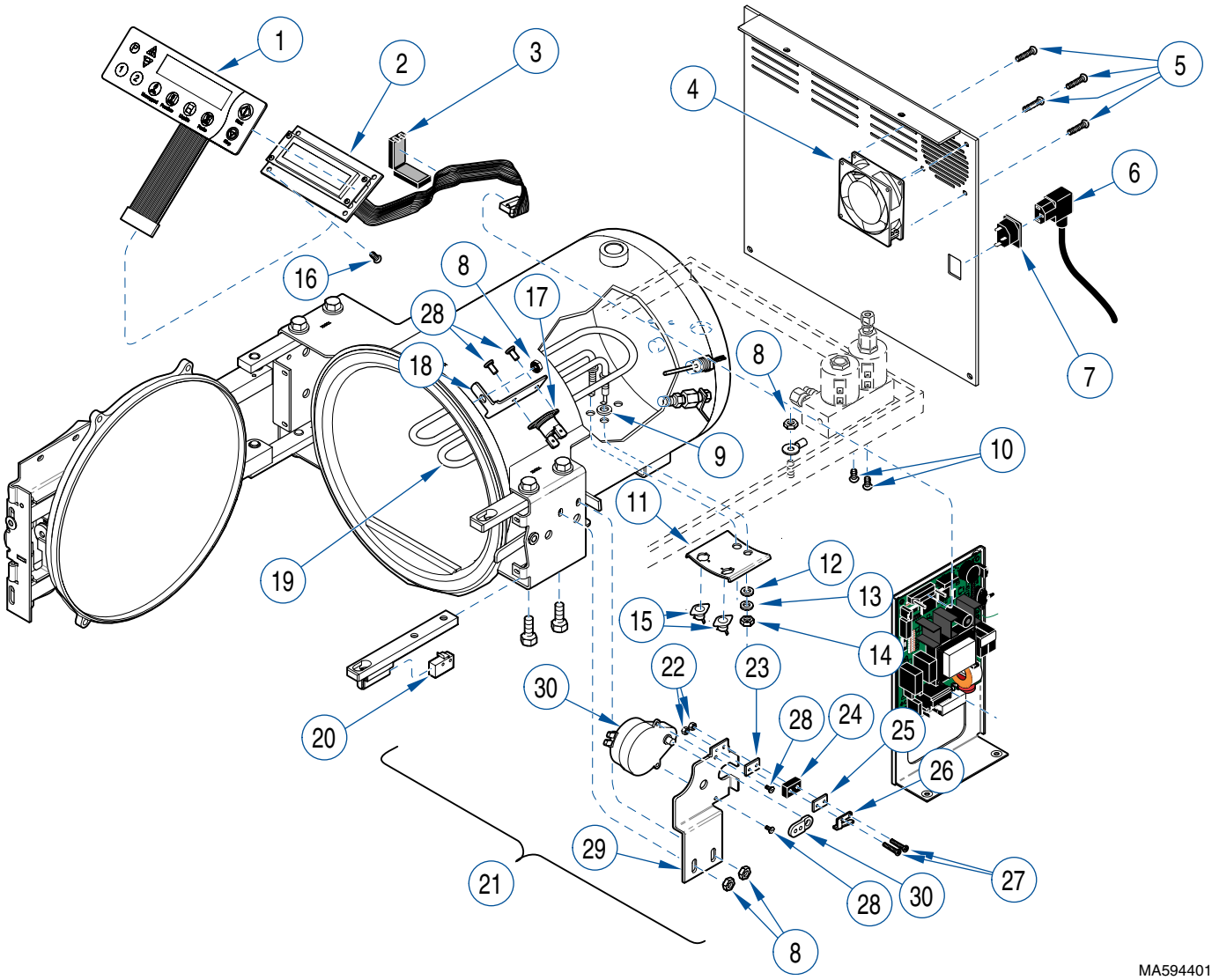
Electrical Components



MA594401i

Used on units with Serial Numbers: RN001000 thru RN001184, RN001236 thru RN001240, RP001000 thru RP001004 and RR001000 thru RR001368

Item	Part No.	Description	Qty
1	015-1551-00	Membrane Switch	1
2	015-1550-00	Display Assembly	14
3	015-1641-00	Suppression Coil	1
4	015-1368-00	Fan-{115 Volt}	1
	015-1368-01	Fan-{230 Volt}	1
5	040-0010-125	Screw	6
6	015-0640-00	Power Cord (115 Volt)	1
	015-0363-07	Power Cord (230 Volt)	1
7	015-0639-00	AC Connector Receptacle	1
8	041-0010-04	Nut	8
9	H98137	Insulator	2
10	040-0010-74	Screw	2
11	050-5206-00	Plate	1
12	H97971	Washer	2
13	045-0001-56	Lock washer	2
14	015-0976-00	Nut	2
15	015-1637-00	Thermostat	2
16	040-0006-04	Screw	2
17	015-1430-00	Fan Control Thermostat	1
18	050-5459-00	Thermostat Bracket	1
19	015-0645-00	Heating Element (115 Volt)	1
	015-0645-01	Heating Element (230 Volt)	1
20	015-1556-00	Door Switch	1
		Items #23 thru #30 refer to M9 units only.	
21	029-3038-02	Door Motor Assembly (115 volt)	1
	029-3038-03	Door Motor Assembly (230 volt)	1
22	• 041-0002-01	• Nut	2
23	• 053-1348-00	• Insulating Membrane	2
24	• 015-1672-00	• Switch	1
25	•	• Insulating Membrane	1
26	• 015-1671-00	• Switch Actuator (Includes Items 21, 24, and 26)	1
27	• 040-0010-75	• Screw	2
28	• 042-0010-21	• Pop Rivot	4
29	• 050-5668-00	• Door Latch Motor Bracket	1
30	• 015-1670-00	• Door Motor Assembly (115 Volt)	1
	• 015-1670-01	• Door Motor Assembly (230 Volt)	1

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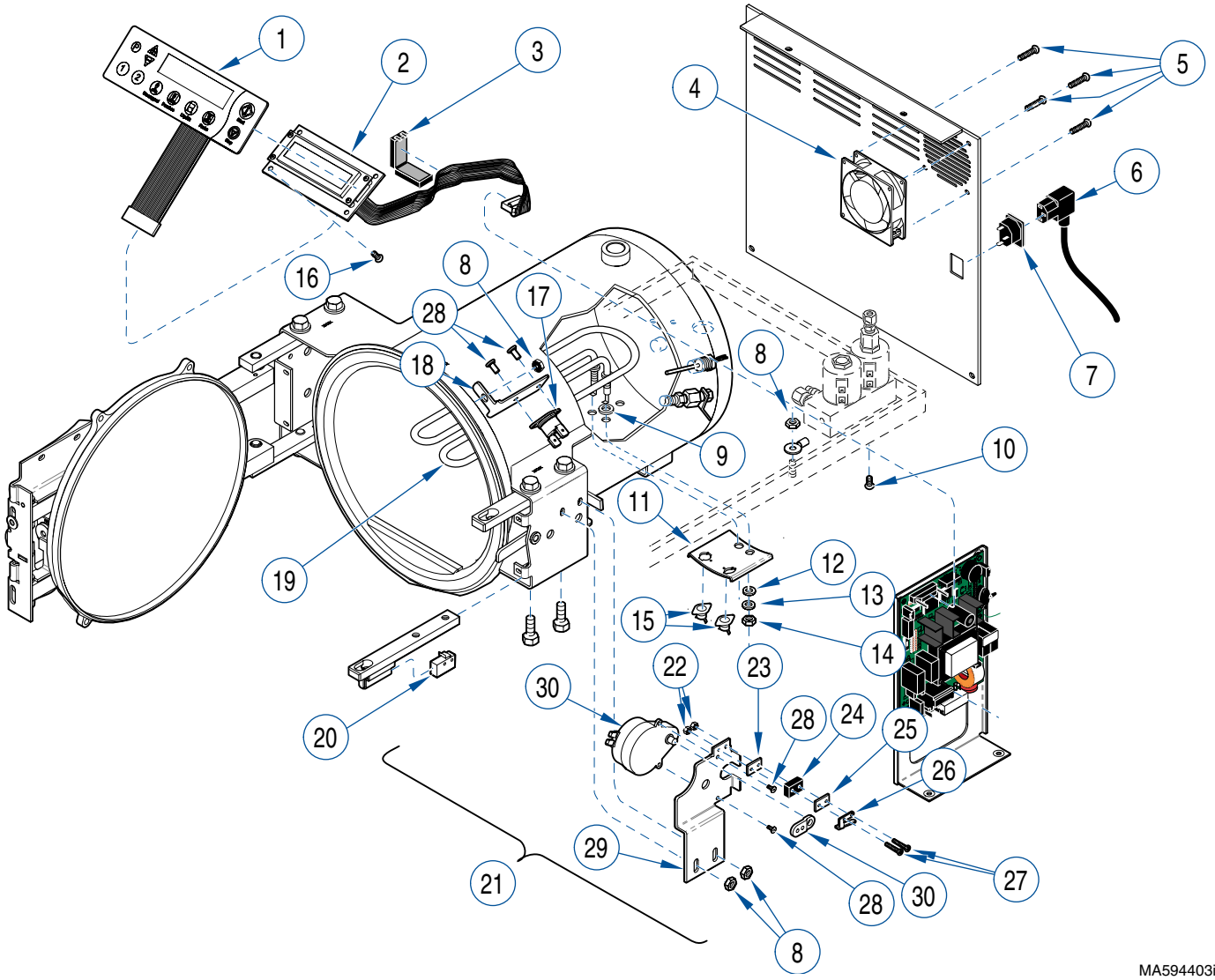
Electrical Components



MA594403i

Used on units with Serial Numbers: RN001185 thru RN001235 & RN001241, RP001005, RR001369, RW001000 and RX001000 thru Present

Item	Part No.	Description	Qty
1	015-1551-00	Membrane Switch	1
2	015-1550-00	Display Assembly	14
3	015-1641-00	Suppression Coil	1
4	015-1368-00	Fan-{115 Volt}	1
	015-1368-01	Fan-{230 Volt}	1
5	040-0010-125	Screw	6
6	015-0640-00	Power Cord (115 Volt)	1
	015-0363-07	Power Cord (230 Volt)	1
7	015-0639-00	AC Connector Receptacle	1
8	041-0010-04	Nut	8
9	H98137	Insulator	2
10	040-0010-75	Screw	1
11	050-5206-00	Plate	1
12	H97971	Washer	2
13	045-0001-56	Lock washer	2
14	015-0976-00	Nut	2
15	015-1637-00	Thermostat	2
16	040-0006-04	Screw	2
17	015-1430-00	Fan Control Thermostat	1
18	050-5459-00	Thermostat Bracket	1
19	015-0645-00	Heating Element (115 Volt)	1
	015-0645-01	Heating Element (230 Volt)	1
20	015-1556-00	Door Switch	1
		Items #23 thru #30 refer to M9 units only.	
21	029-3038-00	Door Motor Assembly (115 volt)	1
	029-3038-01	Door Motor Assembly (230 volt)	1
22	• 041-0002-01	• Nut	2
23	• 053-1348-00	• Insulating Membrane	2
24	• 015-1672-00	• Switch	1
25	•	• Insulating Membrane	1
26	• 015-1671-00	• Switch Actuator (Includes Items 21, 24, and 26)	1
27	• 040-0010-75	• Screw	2
28	• 042-0010-21	• Pop Rivot	4
29	• 050-5668-00	• Door Latch Motor Bracket	1
30	• 015-1763-00	• Door Motor Assembly (115 Volt)	1
	• 015-1763-01	• Door Motor Assembly (230 Volt)	1

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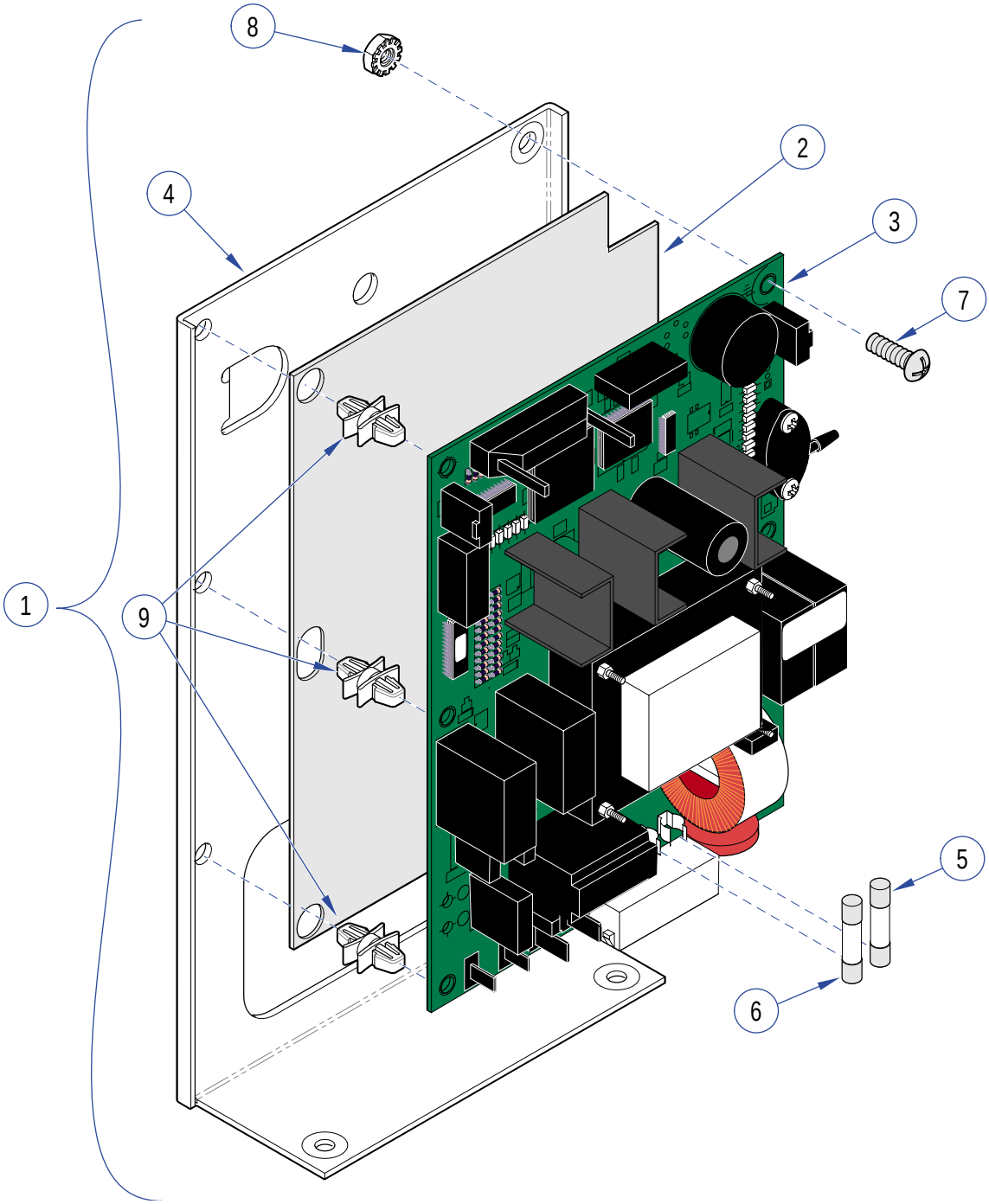
Control PC Board



MA594501i

Item	Part No.	Description	Qty
1	002-0762-00	M9 PC Board Kit (115 volt)	
	002-0762-01	M9 PC Board Kit (230 volt)	
	002-0762-02	M9D PC Board Kit (Includes Items 2 thru 9)	
2	• 053-1259-00	• Insulator	1
3	•	• PC Board	1
4	• 050-5203-10	• PC Board Bracket	1
5	• 016-0346-07	• Fuse (Fast Acting)	1
6	• 016-0346-10	• Fuse (Slow-Blow)	1
7	• 040-0010-46	• Screw	2
8	• 041-0010-04	• Nut	2
9	• 053-1455-00	• PC Board Standoff	4

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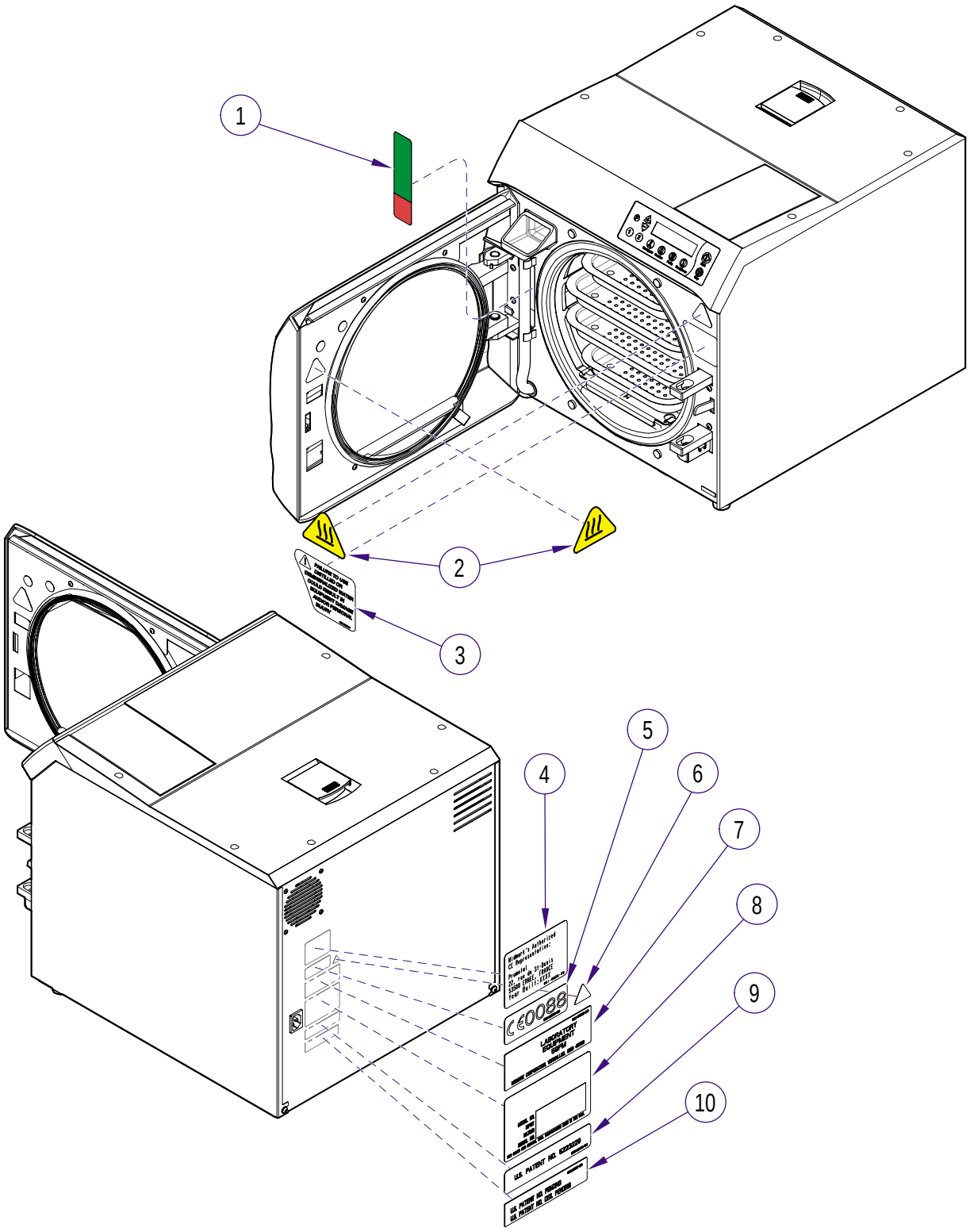
Labels and Decals



Ma606100i

Item	Part No.	Description	Qty	Item	Part No.	Description	Qty
1	061-0311-00	Water Level Indictor	1	6	061-0654-00	Caution Label	1
2	061-0726-00	Hot Surface Label	2	7	061-0729-00	C.U.L. Listing Label	1
3	061-0827-00	Distilled Water Label	1	8		Serial Number Tag	1
4	061-0826-00	CE Representative Label	1	9	061-0848-00	Patent Label	1
5	061-0828-00	CE 0088 Label	1	10	061-0727-00	Patent Pending Label	1

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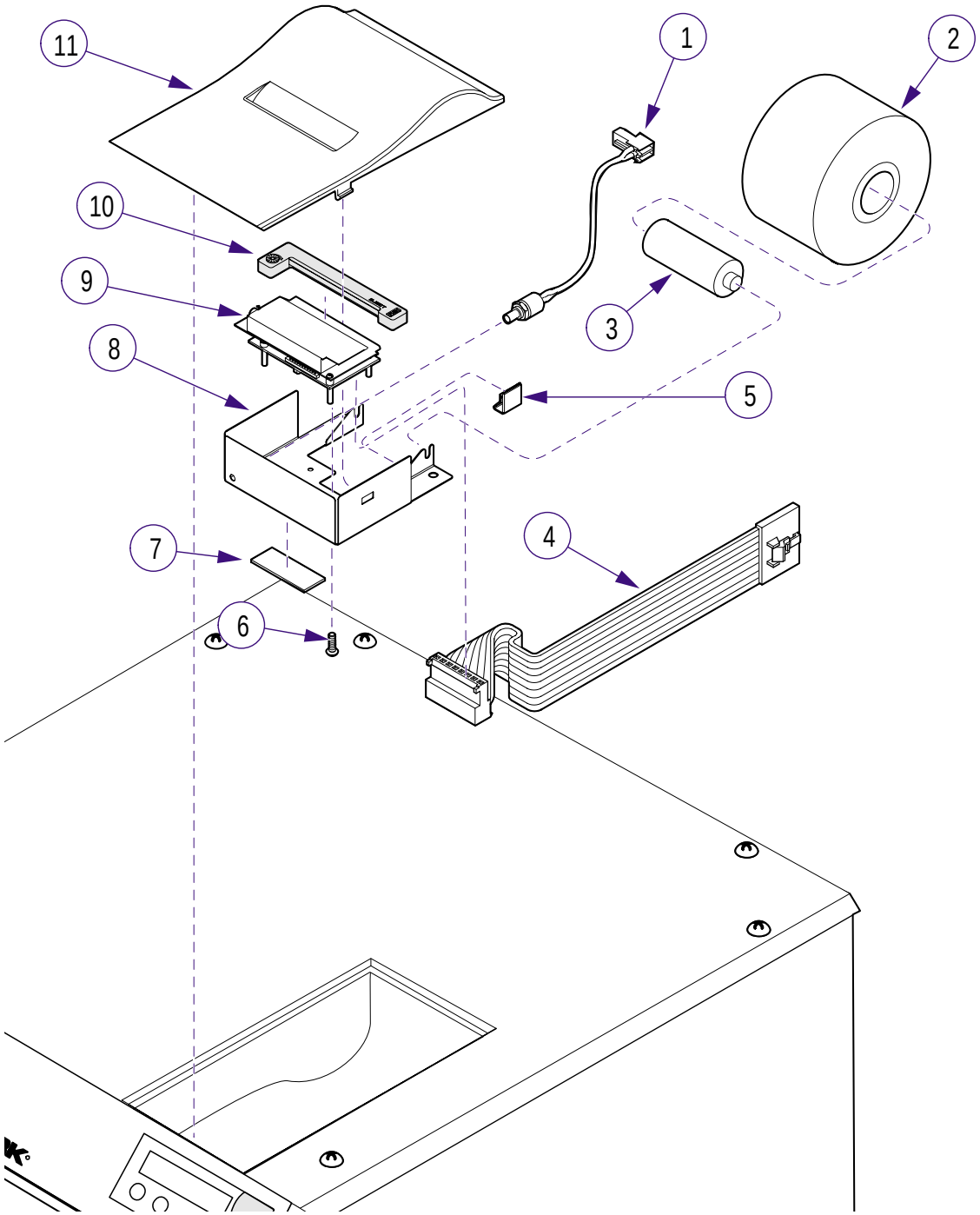

MA598600i

Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
	9A259			6	040-0002-07	Screw	4
1	015-1323-00	Printer Feed Cable	1	7		Accessory Serial Number Tag	1
2	060-0008-00	Paper Roll	1	8	050-5011-00	Printer Bracket	1
3	053-0506-00	Paper Roll Spindle	1	9	015-1255-00	Printer	1
4	015-1529-00	Printer Ribbon Cable Assembly	1	10	053-0505-00	Printer Ribbon	1
5	053-1231-01	Flat Wire Cable Clamp	1	11	053-0927-00	Printer Cover	1

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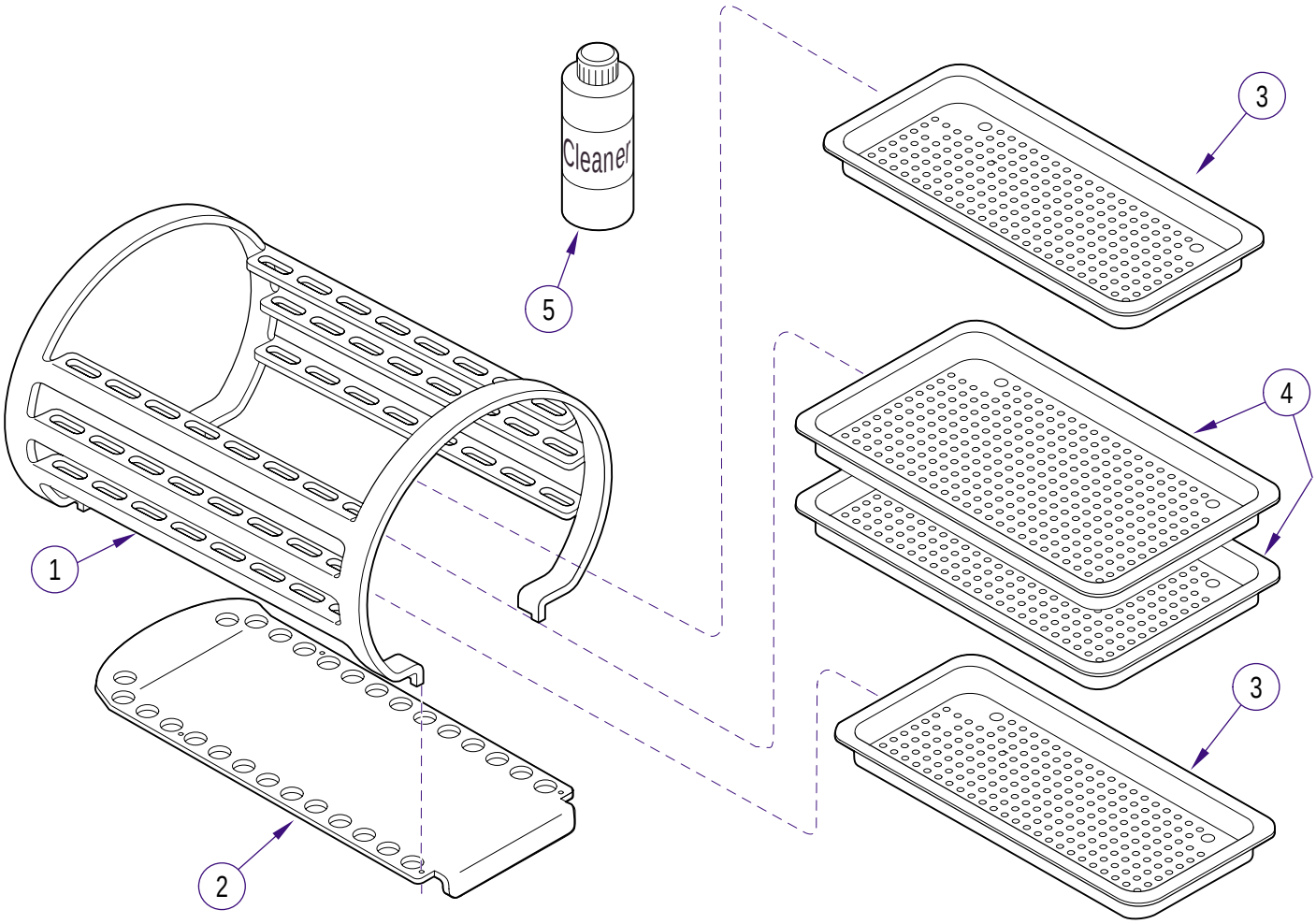
Racks, Trays, and Cleaner



MA604900i

Item	Part No.	Description	Qty.
1	050-3691-00	Wire Tray Rack	1
2	050-3750-00	Tray Plate	1
3	050-1595-00	Small Tray	2
4	050-1772-00	Large Tray	2
5	002-0269-00	Sterilizer Cleaner-Ritter (Single Bottle with M.S.D.Sheet)	AR
	002-0269-01	Sterilizer Cleaner-Ritter (12 Bottle Case with M.S.D.Sheet)	AR
	002-0396-00	Sterilizer Cleaner-Midmark (Single Bottle with M.S.D.Sheet)	AR
	002-0396-01	Sterilizer Cleaner-Midmark (12 Bottle Case with M.S.D.Sheet)	AR

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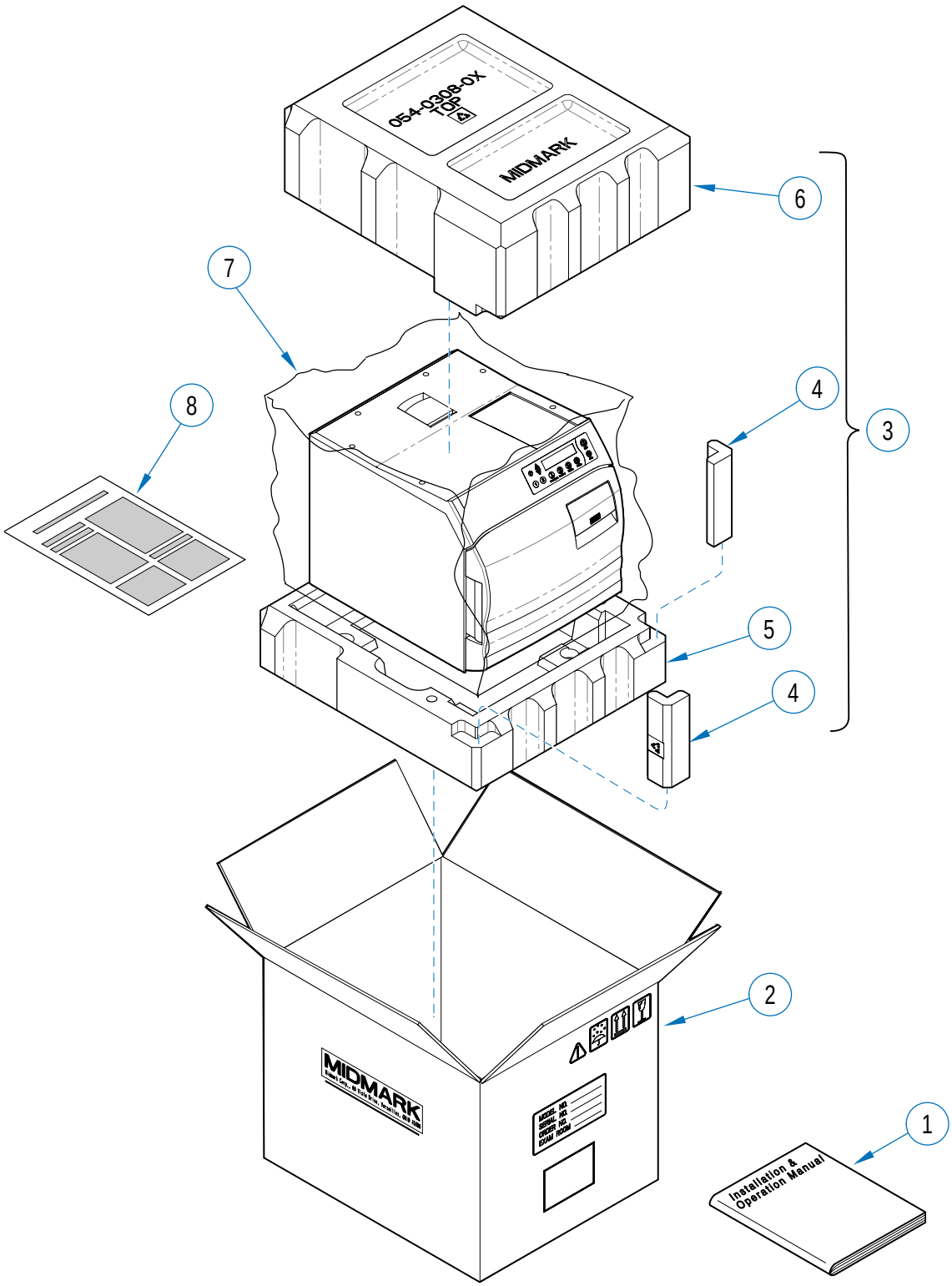
Packaging



MA594600

Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
1	003-1249-00	Installation/Operation Manual	1	5	054-0305-00	Bottom Pad	1
2	066-0773-00	Carton	1	6	054-0304-00	Top Pad	1
3	054-0338-00	M9/M9D Packaging (Incl. Items 4 thru 6)		7	053-0061-01	Plastic Bag	1
4	054-0310-00	Corners	2	8	077-0033-00	Material Safety Data Sheet	1

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SECTION VI
PARTS LIST

Attention

**The Parts Lists in this manual are separated as shown below.
Verify Model Number, then refer to appropriate pages.**

M9 / M9D..... Pages 6-2 thru 6-12

M11 / M11D..... Pages 6-14 thru 6-24

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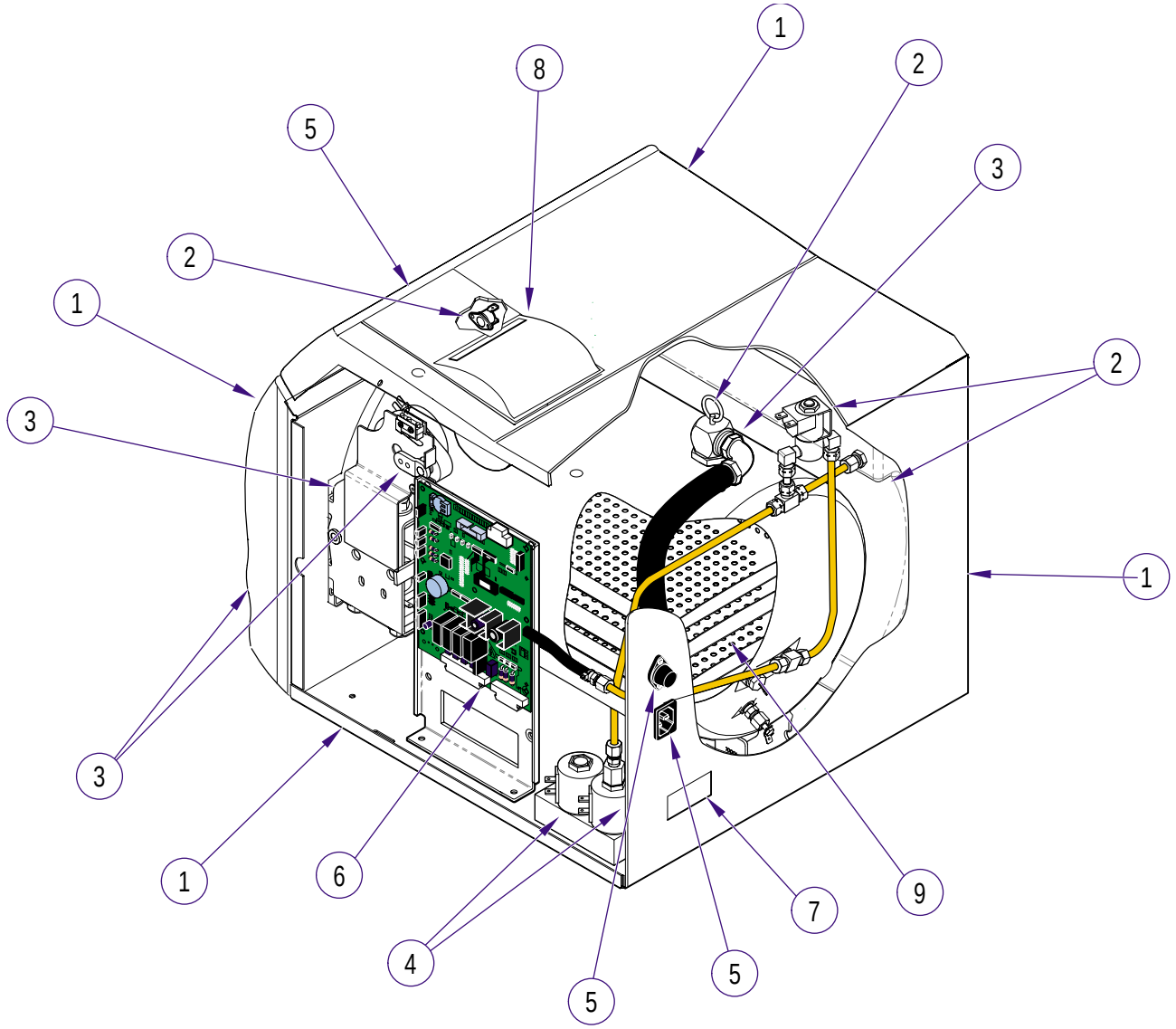

MA593700i

Item	Part No.	Description	Qty
	M11-020	Midmark M11 Ultraclave (115 VAC [Serial Number Prefix “RS”])	6-2
	M11-021	Midmark M11 Ultraclave (230 VAC [Serial Number Prefix “RT”])	6-2
	M11-022	Ritter M11 Ultraclave (115 VAC [Serial Number Prefix “RV”])	6-2
	M11D-020	Midmark M11 Ultraclave (115 VAC [Serial Number Prefix “RY”])	6-2
	M11D-022	Ritter M11 Ultraclave (115 VAC [Serial Number Prefix “RZ”])	6-2

Item	Part No.	Description	Qty
1		Main Enclosures	6-3
2		Plumbing and Sensors	6-4
3		Pressure Vessel Components	6-5
4		Manifold Components	6-6
5		Electrical Components	6-7
6		Control PC Board	6-8
7		Labels and Decals	6-9
8		Printer Components (Not Shown)	6-10
9		Racks, Trays, and Cleaner	6-11
10		Packaging	6-12

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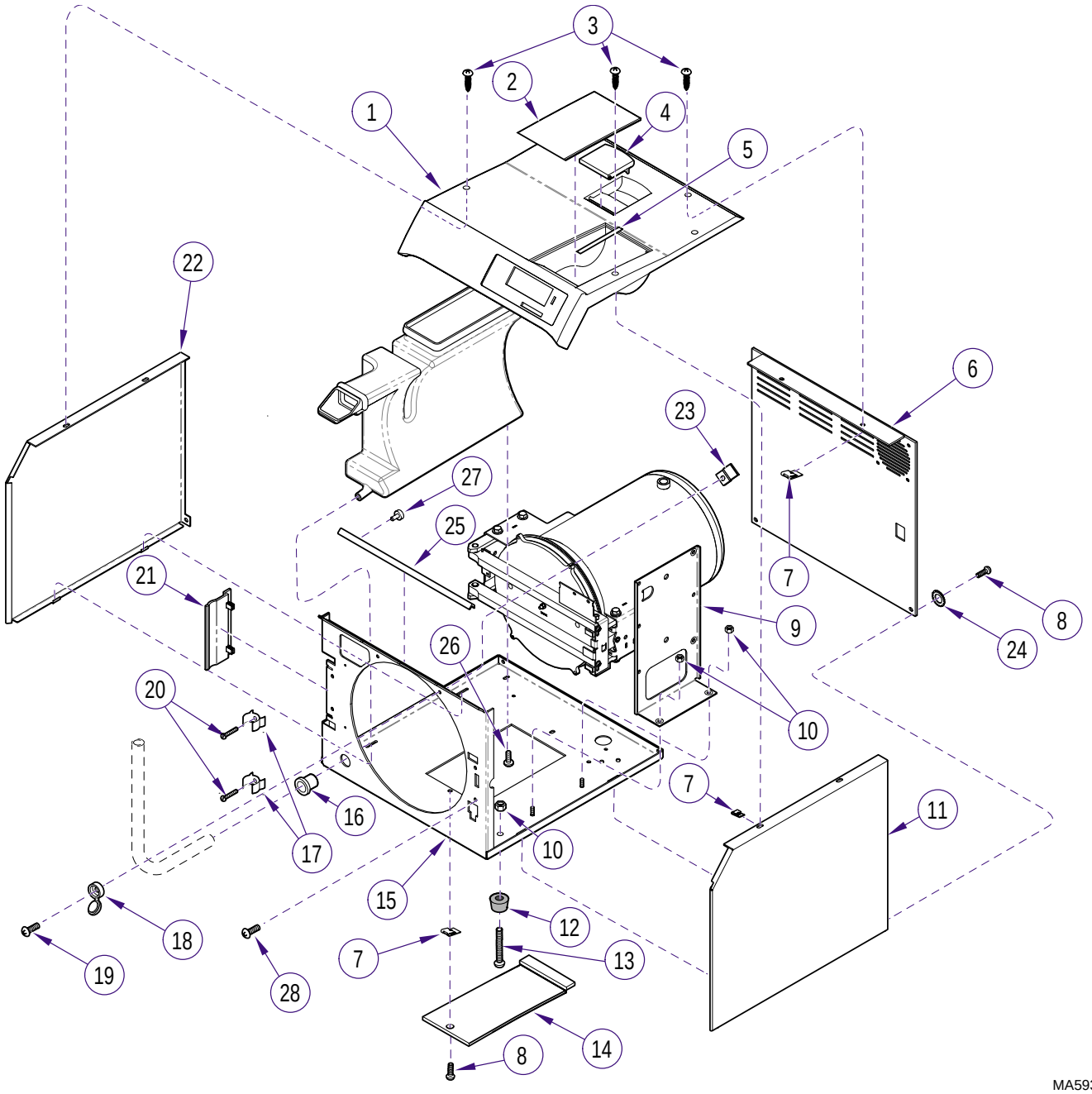
Main Enclosures



MA593400i

Item	Part No.	Description	Qty
1	053-1254-00	Top Cover (Midmark)	1
	053-1254-01	Top Cover (Ritter)	1
2	053-0933-00	Cover Plate - Printer	1
3	040-0010-88	Screw	6
4	053-1252-00	Pressure Relief Handle	1
5	042-0204-01	Adhesive Strips	3
6	050-5244-10	Back Panel	1
7	H352623	Tinnerman Nut	9
8	040-0010-125	Screw	3
9		PC Bracket (Refer to “Control PC Board” Elsewhere)	1
10	041-0010-04	Nut	10
11	050-5228-10	Side Panel	1
12	016-0523-03	Leveling Foot	4
13	040-0010-137	Leveling Screw	4
14	050-4326-00	Base Inspection Cover	1

Item	Part No.	Description	Qty
15	029-3125-00	Base Panel (M11)	1
	029-3125-01	Base Panel (M11D)	1
16	053-0068-11	Strain Relief Bushing	1
17	053-0388-01	Hose Clip	2
18	053-0723-00	Screw Cover	4
19	040-0010-124	Screw	2
20	042-0010-21	Pop Rivet	2
21	053-1277-00	Hinge Cover	1
22	050-5227-10	Side Panel	1
23	050-4750-00	Flange Clamp	4
24	045-0001-31	Lock Washer	1
25	053-1370-02	Steam Block	1
26	040-0010-74	Screw	4
27	042-0182-00	Snap Clip	4
28	040-0010-95	Screw	4

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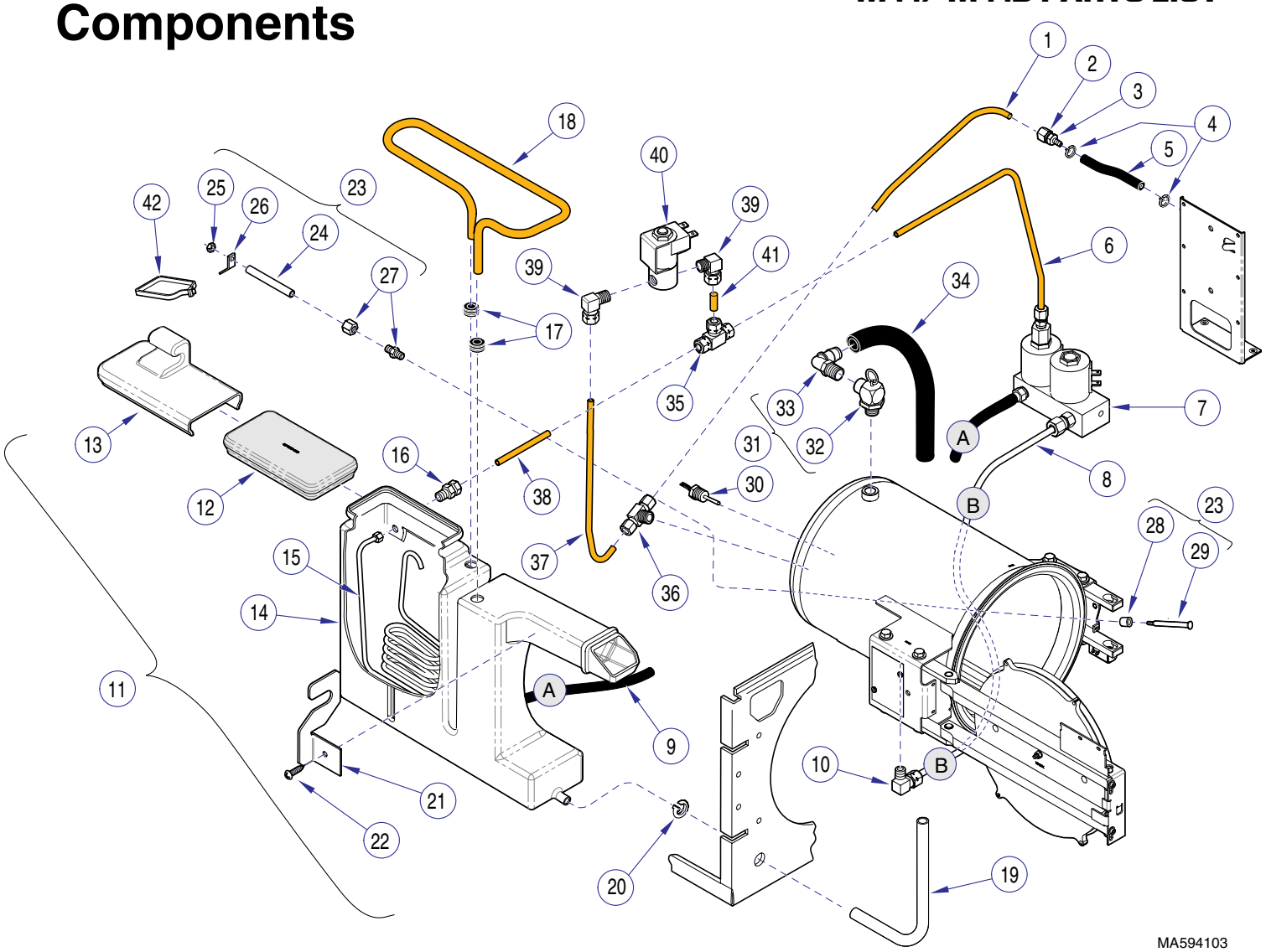
Plumbing and Sensor Components



MA594103

Item	Part No.	Description	Qty
1	014-0429-00	PCB Pressure Sensor Tube	1
2	014-0192-00	Compression Nut	1
3	014-0217-00	Compression Connector	1
4	015-0013-05	Cable Tie (High Temp)	2
5	053-0404-05	Tube PCB Connector	1
6	014-0415-00	Tube	1
7		Manifold (Refer to “Manifold Components”)	6-6
8	014-0413-00	Tube	1
9	053-1033-05	Tube	1
10	014-0184-01	Male 90° Elbow	1
11	029-2754-00	Reservoir Tank Assembly(Includes Items 13 thru 21	
12	• 053-1303-00	• Reservoir Tank Seal	1
13	• 053-1258-02	• Reservoir Lid	1
14	• 053-1258-01	• Reservoir Tank	1
15	• 014-0421-00	• Condensing Coil Tube	1
16	• 014-0216-00	• Bulkhead Fitting	1
17	• 053-0394-03	• Grommet	2
18	• 014-0426-00	• Equalization Tube	1
19	• 053-0391-07	• Sight/Drain Tube	1
20	• 016-0748-01	• Hose Clamp	1
21	• 050-5684-00	• Equalization Coil Bracket	1
22	• 040-0010-75	• Screw	1
23	002-0358-00	Level Sensor Tube Kit	
24	• 053-0390-01	• Tube	1
25	• 041-0006-02	• Nut	1
26	• 015-0595-00	• Terminal	1
27	• 014-0183-01	• Compression Nut	1
28	• 053-0407-00	• Spacer	1
29	• 030-0858-00	• Level Sensor Assembly	1
30	015-1680-00	Temperature Probe Assembly	1
31	002-0359-01	Pressure Relief Valve Kit(Includes Items 33 thru 34)	
32	• 014-0195-03	• Pressure Relief Valve	1
33	• 014-0258-00	• Male Elbow	1
34	053-0613-02	Neoprene Tubing	1
35	014-0423-00	Union Tee	1
36	014-0202-03	Male Branch Tee	1
37	014-0414-00	Tube	1
38	014-0411-00	Tube	1
39	014-0184-00	Elbow	2
40	014-0419-00	Solenoid (115 volt)	1
	014-0419-01	Solenoid (230 volt)	1
41	014-0424-00	Tube	1
42	015-0013-03	Wire Tie	1

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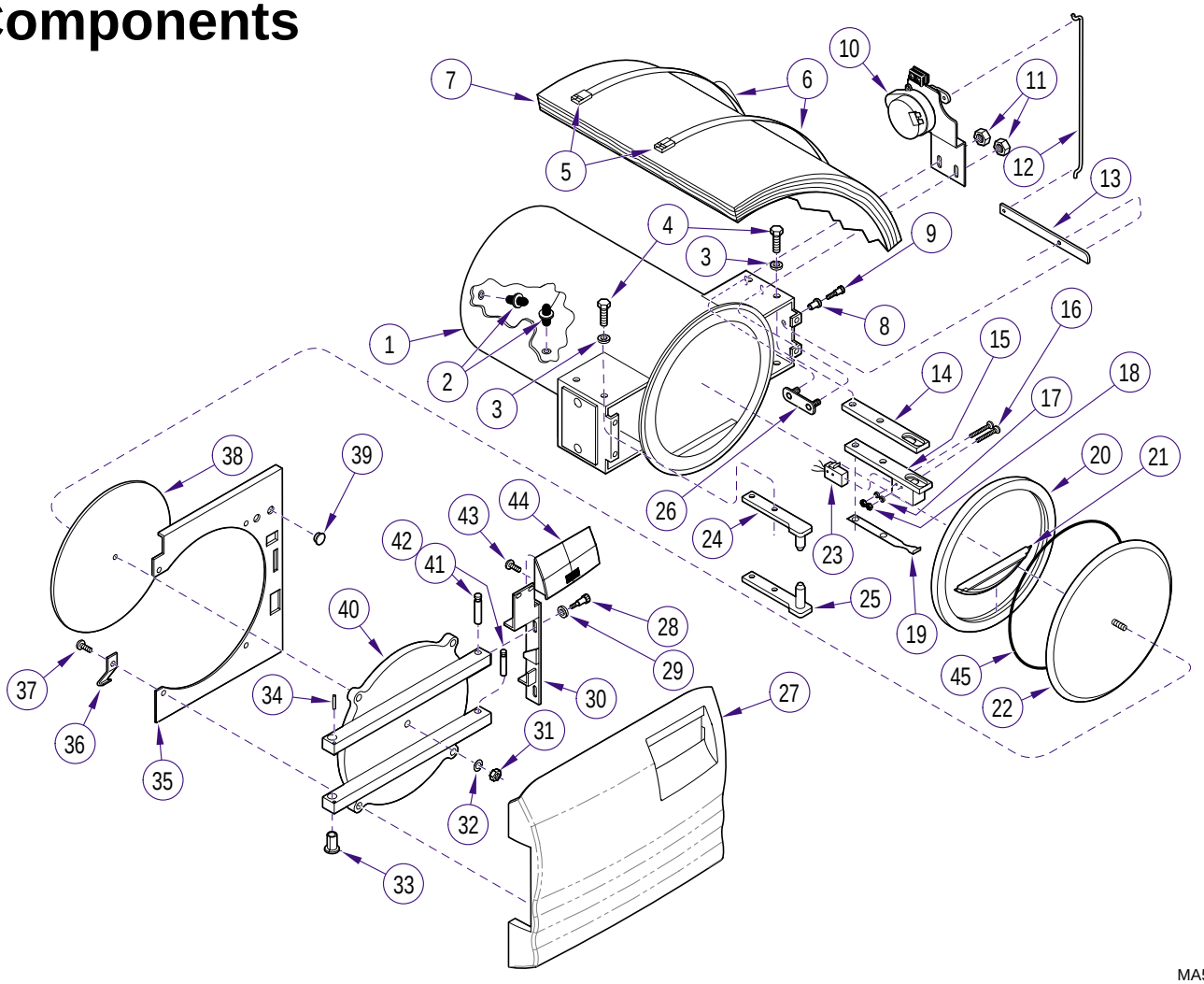
Pressure Vessel Components



MA594203i

Item	Part No.	Description	Qty
1		Chamber	1
2	002-0360-00	Filter	2
3		Washer	8
4		Screw	8
5	H99387	Aluminum Seal	2
6	H99388-44	Insulation Strap	2
7	053-1262-00	Insulation Wrapper	1
	Items #8 thru #13 refer to M11 units only.		
8	045-0000-04	Brass Washer	2
9	042-0106-01	Shoulder Screw (Apply Valve Lubricant #064-0002-00])	2
10		Door Opening Motor Assembly(Refer to "Electrical Components Elsewhere")	6-7
11	041-0010-04	Nuts	2
12	057-0755-00	Motor Connecting Rod	1
13	050-5685-00	Latch Lever	1
14		Right Bracket	1
15		Switch Weldment	1
16	040-0002-08	Screw	2
17	045-0001-80	Washer	2
18	041-0002-01	Nut	2
19	050-5245-00	Switch Spring	1
20	053-0527-00	Door Gasket (Incl. in 002-0504-00 Kit)	1
21	053-0904-00	Dam Gasket (Incl. in 002-0504-00 Kit)	1
22	030-0879-00	Housing	1

Item	Part No.	Description	Qty
	23	Door Switch (Refer to "Electrical Components" Page 6-7, Elsewhere)	1
24		Top Bracket	1
25		Bottom Bracket	1
26	029-3055-00	Stud Plate	1
27	053-1255-00	M11 Door Panel	1
	053-1255-01	M11D Door Panel	1
28	042-0106-00	Shoulder Screw	2
29	045-0000-04	Washer	2
30	050-5243-01	Latch Bracket	1
31	041-0000-00	Nut	1
32	045-0000-00	Lockwasher	1
33		Flange Bearing	2
34	042-0104-00	Roll Pin	1
35	050-5229-00	Inside Door Cover	1
36	050-2347-00	Door Spring	1
37	040-0008-50	Screw	4
38	016-0395-02	Door Insulation Pad	1
39	053-0050-00	Plug	2
40		Door	1
41		Door Bolt 5669	2
42	064-0014-00	Grease	AR
43	040-0010-75	Screw	2
44	053-1253-00	Door Handle	1
45	057-0790-00	Door Gasket Ring	1

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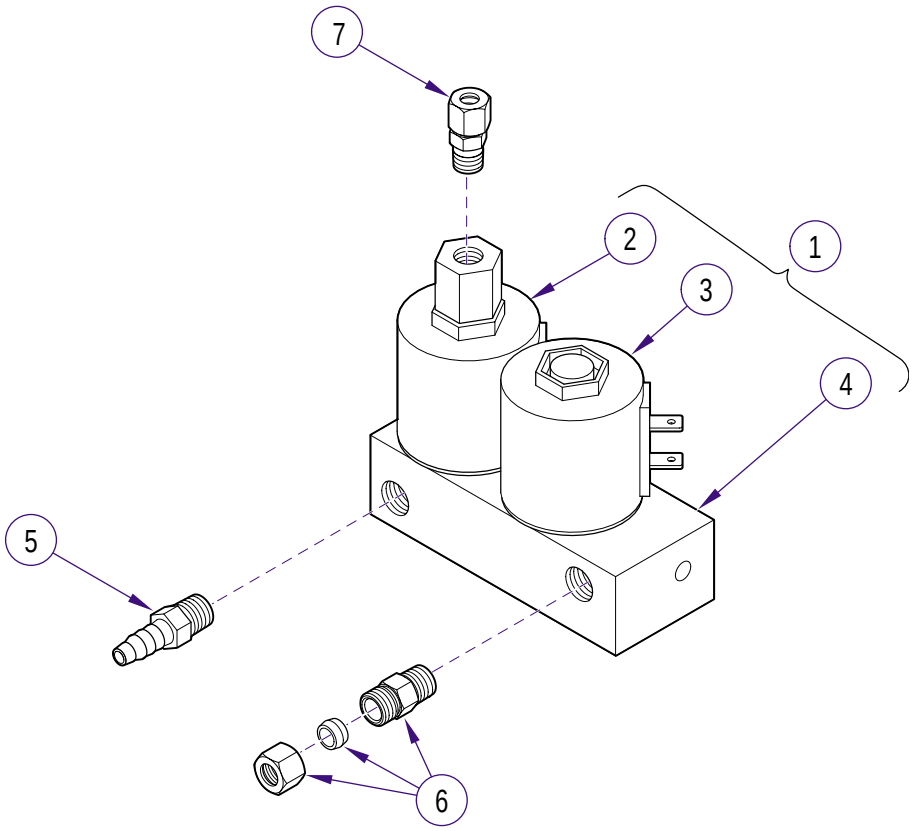

MA606000i

Item	Part No.	Description	Qty
	029-2755-00	Manifold Assembly (115 volt)	
	029-2755-01	Manifold Assembly (230 volt)	
1	• 014-0420-00	• Solenoid Valve Manifold (115 volt)	1
	• 014-0420-01	• Solenoid Valve Manifold (230 volt)	1
2	• • 014-0275-00	• • Solenoid Valve (Vent) (115 volt)	1
	• • 014-0275-01	• • Solenoid Valve (Vent) (230 volt)	1
	• • • 014-0236-11	• • • Replacement Plunger (not shown)	
3	• • 014-0236-00	• • Solenoid Valve (Fill) (115 volt)	1
	• • 014-0236-01	• • Solenoid Valve (Fill) (230 volt)	1
	• • • 014-0236-11	• • • Replacement Plunger (not shown)	1
	• • • 014-0236-10	• • • Coil (115 volt not shown)	1
4	•	• Manifold Block	1
5	• 014-0347-00	• Barb Fitting	1
6	• 014-0183-01	• 1/4 Fitting	1
7	• 014-0183-02	• 3/8 Fitting	1

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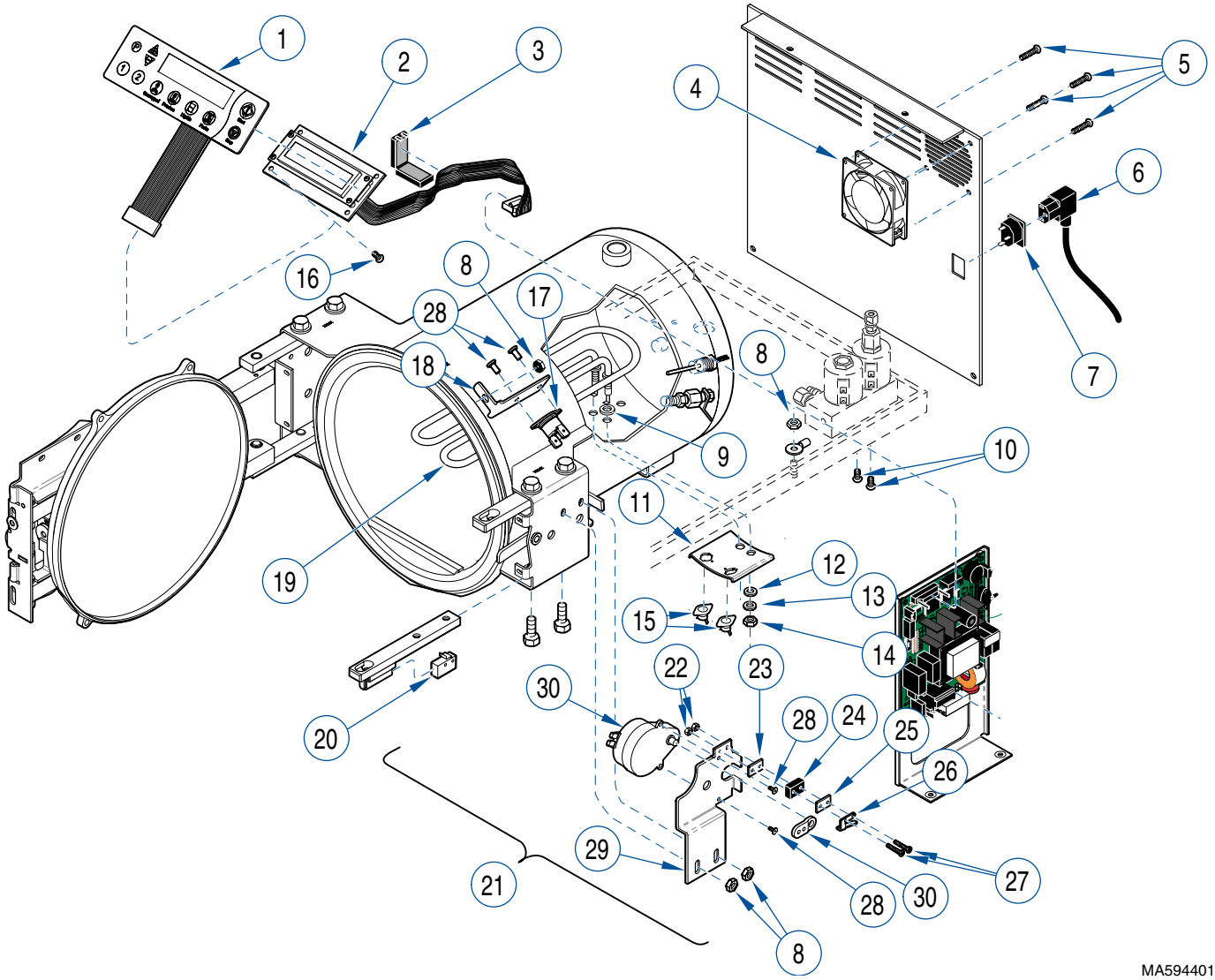

MA594401i

Used on units with Serial Numbers RS001000 thru RS001299, RT001000 thru RT001026, RV001000 thru RV001179

Item	Part No.	Description	Qty
1	015-1551-00	Membrane Switch	1
2	015-1550-00	Display Assembly	1
3	015-1641-00	Suppression Coil	1
4	015-1368-00	Fan-{115 Volt}	1
	015-1368-01	Fan-{230 Volt}	1
5	040-0010-125	Screw	6
6	015-0640-00	Power Cord(115 Volt)	1
	015-0363-07	Power Cord (230 Volt)	1
7	015-0639-00	AC Connector Receptacle	1
8	041-0010-04	Nut	8
9	H98137	Insulator	2
10	040-0010-74	Screw	2
11	050-5206-00	Plate	1
12	H97971	Washer	2
13	045-0001-56	Lock washer	2
14	015-0976-00	Nut	2
15	015-1637-00	Thermostat	2
16	040-0006-04	Screw	4
17	015-1430-00	Fan Control Thermostat	1
18	050-5459-00	Thermostat Bracket	1
19	015-0976-00	Heating Element (115 Volt)	1
	015-0976-01	Heating Element (230 Volt)	1
20	015-1556-00	Door Switch	1
		Items #23 thru #30 refer to M11 units only.	
21	029-3038-02	Door Motor Assembly (115 volt)	1
	029-3038-03	Door Motor Assembly (230 volt)	
22	• 041-0002-01	• Nut	2
23	• 053-1348-00	• Insulating Membrane	2
24	• 015-1672-00	• Switch	1
25	• •	• • Insulating Membrane	1
26	• 015-1671-00	• Switch Actuator (Included Items 21, 24, and 26)	1
27	• 040-0010-75	• Screw	2
28	• 042-0010-21	• Pop Rivot	4
29	• 050-5668-00	• Door Latch Motor Bracket	1
30	• 015-1670-00	• Door Motor Assembly (115 Volt)	1
	• 015-1670-01	• Door Motor Assembly (230 Volt)	1

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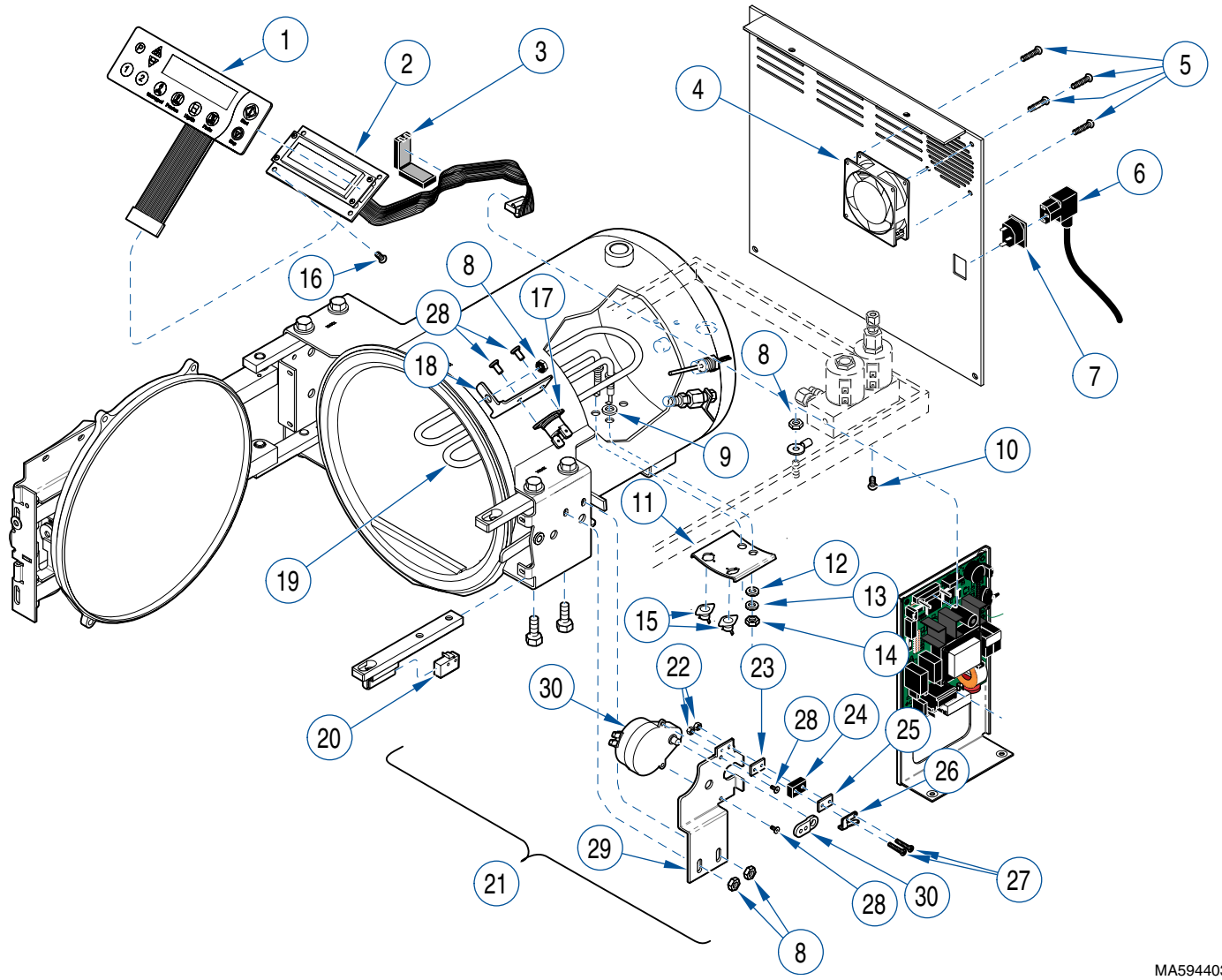

MA594403i

Used on units with Serial Numbers RS001300, RT001027, RV001180, RY001000 and RZ001000 thru Present

Item	Part No.	Description	Qty
1	015-1551-00	Membrane Switch	1
2	015-1550-00	Display Assembly	1
3	015-1641-00	Suppression Coil	1
4	015-1368-00	Fan-{115 Volt}	1
	015-1368-01	Fan-{230 Volt}	1
5	040-0010-125	Screw	6
6	015-0640-00	Power Cord(115 Volt)	1
	015-0363-07	Power Cord (230 Volt)	1
7	015-0639-00	AC Connector Receptacle	1
8	041-0010-04	Nut	8
9	H98137	Insulator	2
10	040-0010-75	Screw	1
11	050-5206-00	Plate	1
12	H97971	Washer	2
13	045-0001-56	Lock washer	2
14	015-0976-00	Nut	2
15	015-1637-00	Thermostat	2
16	040-0006-04	Screw	4
17	015-1430-00	Fan Control Thermostat	1
18	050-5459-00	Thermostat Bracket	1
19	015-0976-00	Heating Element (115 Volt)	1
	015-0976-01	Heating Element (230 Volt)	1
20	015-1556-00	Door Switch	1
		Items #23 thru #30 refer to M11 units only.	
21	029-3038-00	Door Motor Assembly (115 Volt)	1
	029-3038-01	Door Motor Assembly (230 Volt)	1
22	• 041-0002-01	• Nut	2
23	• 053-1348-00	• Insulating Membrane	2
24	• 015-1672-00	• Switch	1
25	• •	• • Insulating Membrane	1
26	• 015-1671-00	• Switch Actuator (Included Items 21, 24, and 26)	1
27	• 040-0010-75	• Screw	2
28	• 042-0010-21	• Pop Rivot	4
29	• 050-5668-00	• Door Latch Motor Bracket	1
30	• 015-1763-00	• Door Motor Assembly (115 Volt)	1
	• 015-1763-01	• Door Motor Assembly (230 Volt)	1

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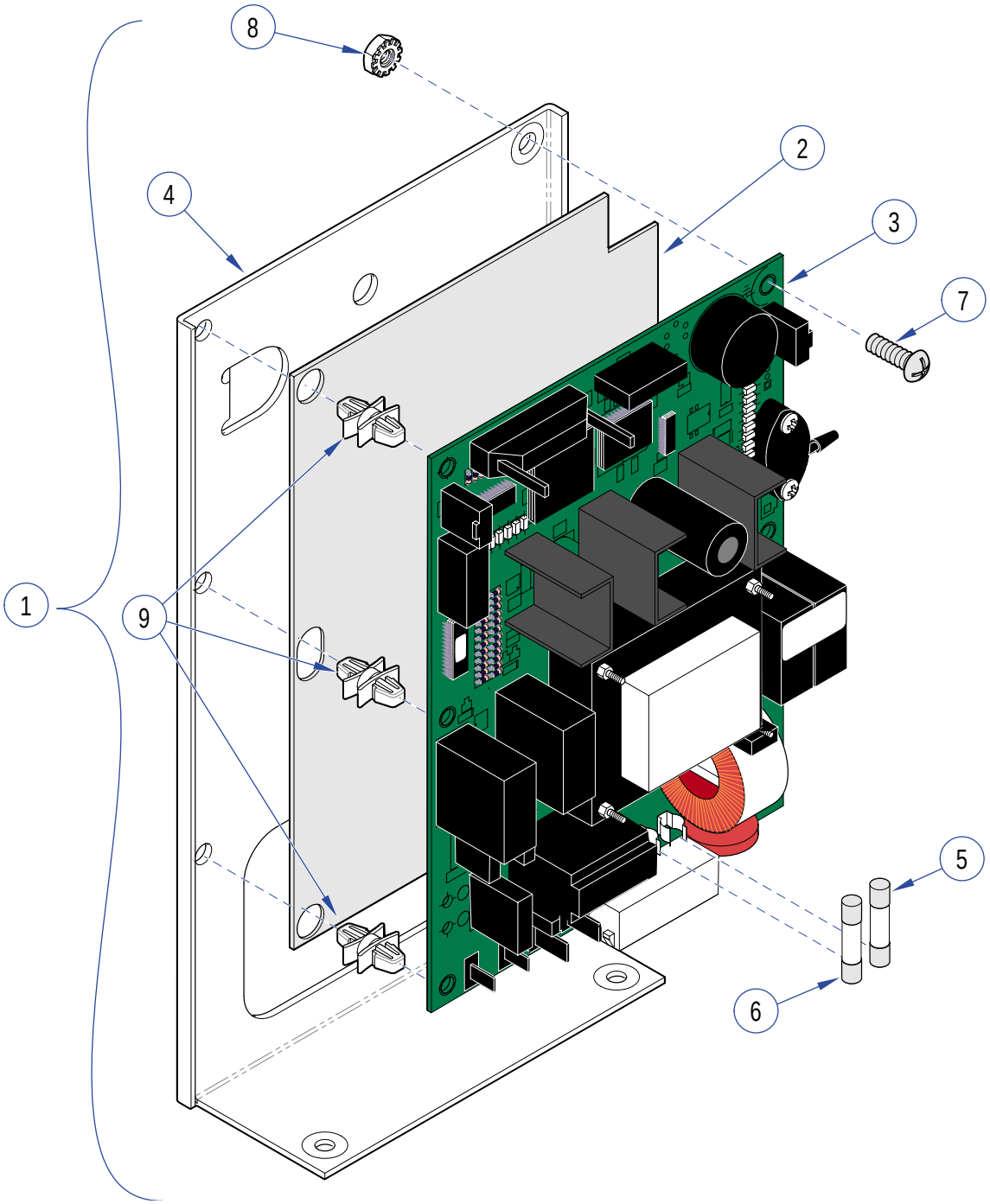
Control PC Board



MA594501i

Item	Part No.	Description	Qty
1	002-0762-00	M11 PC Board Kit (115 volt)	
	002-0762-01	M11 PC Board Kit (230 volt)	
	002-0762-02	M11D PC Board Kit (Includes Items 2 thru 9)	
2	• 053-1259-00	• Insulator	1
3	•	• PC Board	1
4	• 050-5203-10	• PC Board Bracket	1
5	• 016-0346-07	• Fuse (Fast Acting)	1
6	• 016-0346-10	• Fuse (Slow-Blow)	1
7	• 040-0010-46	• Screw	2
8	• 041-0010-04	• Nut	2
9	• 053-1455-00	• PC Board Standoff	4

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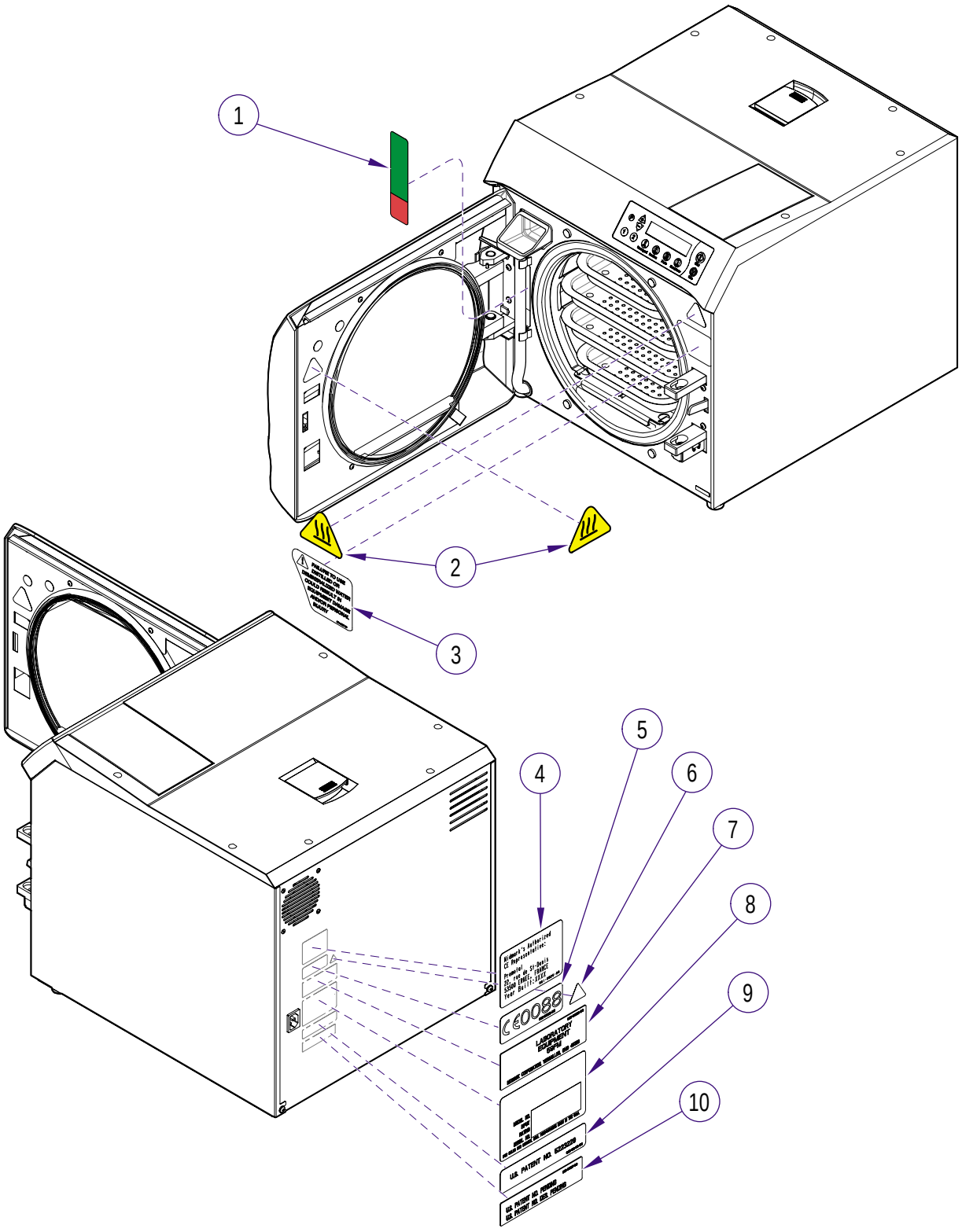
Labels and Decals



Ma606100i

Item	Part No.	Description	Qty	Item	Part No.	Description	Qty
1	061-0311-00	Water Level Indictor	1	6	061-0654-00	Caution Label	1
2	061-0726-00	Hot Surface Label	2	7	061-0729-00	C.U.L. Listing Label	1
3	061-0827-00	Distilled Water Label	1	8		Serial Number Tag	1
4	061-0826-00	CE Representative Label	1	9	061-0848-00	Patent Label	1
5	061-0828-00	CE 0088 Label	1	10	061-0727-00	Patent Pending Label	1

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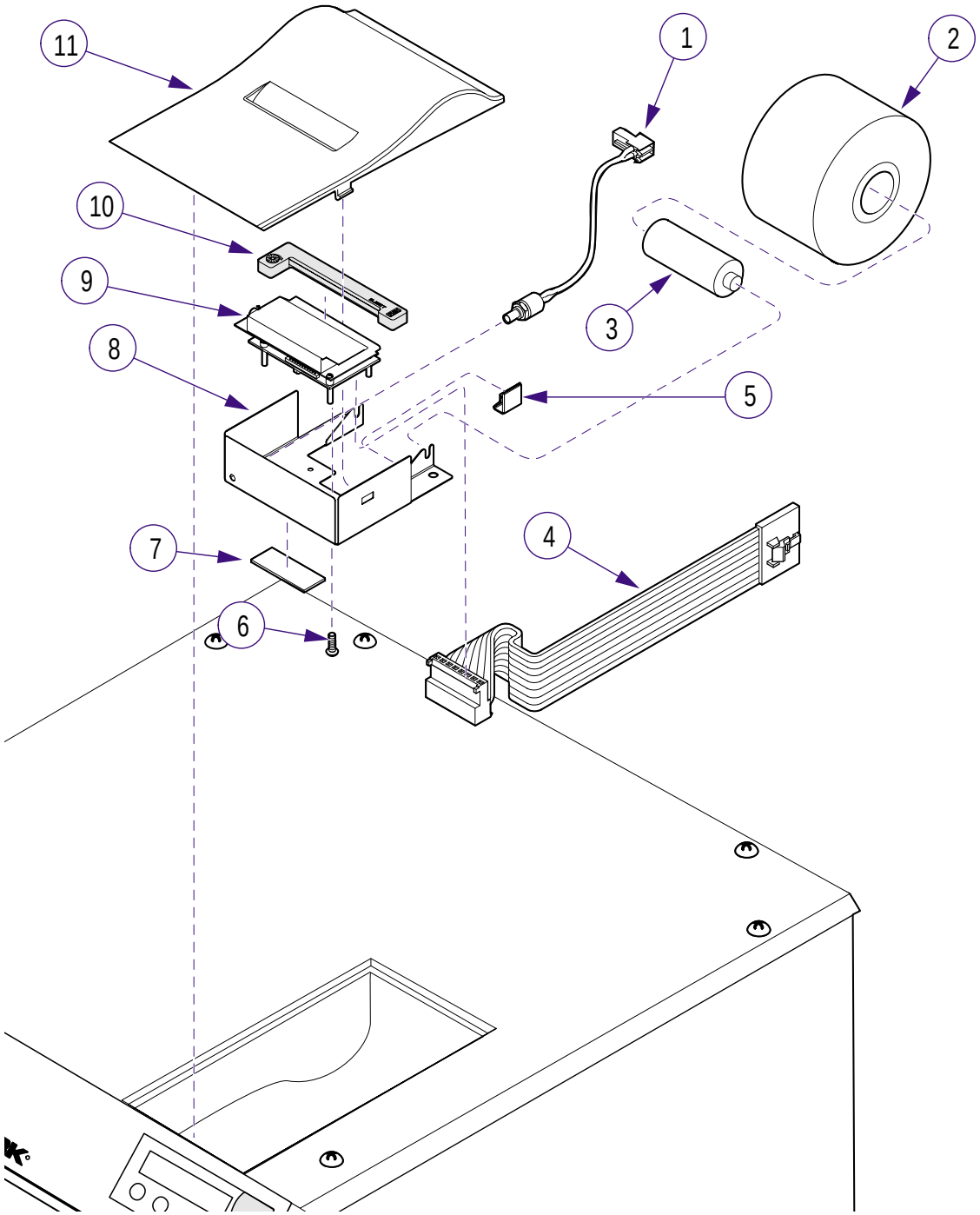

MA598600i

Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
	9A259			6	040-0002-07	Screw	4
1	015-1323-00	Printer Feed Cable	1	7		Accessory Serial Number Tag	1
2	060-0008-00	Paper Roll	1	8	050-5011-00	Printer Bracket	1
3	053-0506-00	Paper Roll Spindle	1	9	015-1255-00	Printer	1
4	015-1529-00	Printer Ribbon Cable Assembly	1	10	053-0505-00	Printer Ribbon	1
5	053-1231-01	Flat Wire Cable Clamp	1	11	053-0927-00	Printer Cover	1

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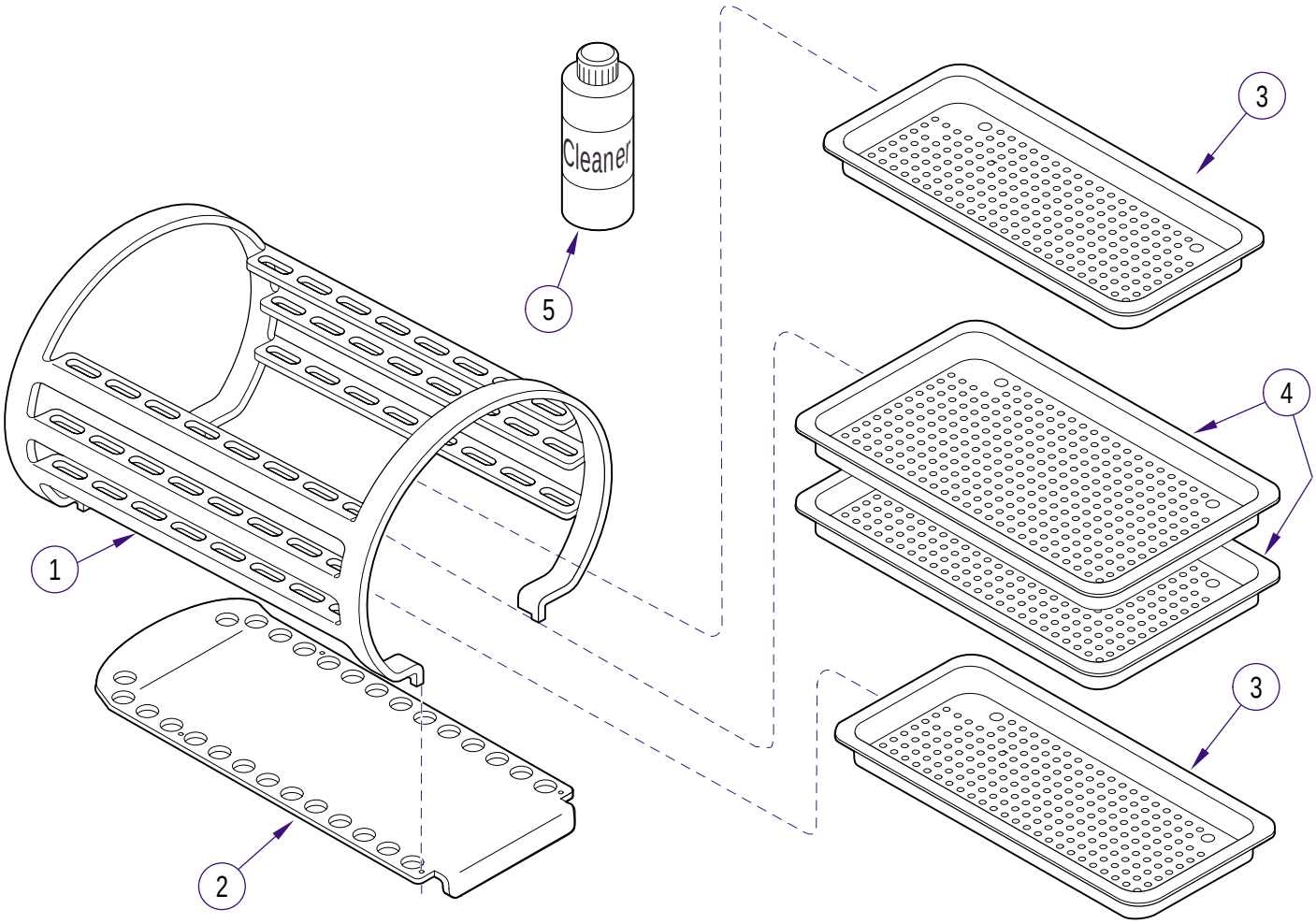
Racks, Trays, and Cleaner



MA604900i

Item	Part No.	Description	Qty.
1	050-3920-00	Wire Tray Rack	1
2	050-3919-00	Tray Plate	1
3	050-4260-00	Small Tray	2
4	050-4259-00	Large Tray	2
5	002-0269-00	Sterilizer Cleaner-Ritter (Single Bottle with M.S.D.Sheet)	AR
	002-0269-01	Sterilizer Cleaner-Ritter (12 Bottle Case with M.S.D.Sheet)	AR
	002-0396-00	Sterilizer Cleaner-Midmark (Single Bottle with M.S.D.Sheet)	AR
	002-0396-01	Sterilizer Cleaner-Midmark (12 Bottle Case with M.S.D.Sheet)	AR

Always Specify Model & Serial Number

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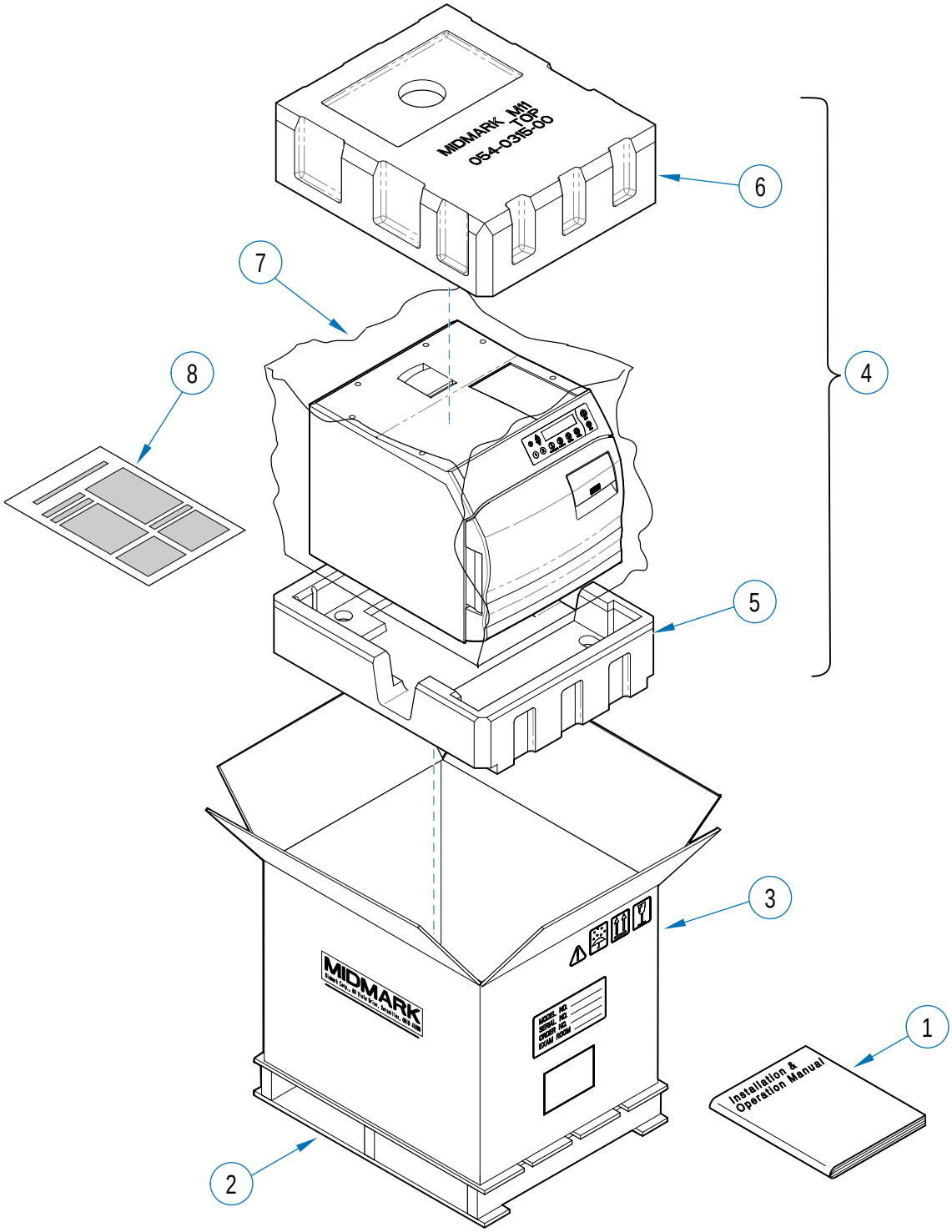

MA598500

Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
1	003-0958-00	Installation/Operation Manual	1	5	054-0307-00	Bottom Pad	1
2	063-9983-00	Skid	1	6	054-0306-00	Top Pad	1
3	066-0844-00	Carton	1	7	053-0061-01	Plastic Bag	1
4	054-0339-00	M11/M11D Packaging (Incl. Items 4 -5)	1	8	077-0033-00	Material Safety Data Sheet	1

Always Specify Model & Serial Number

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COMMENTS

The Technical Publications Department of Midmark Corporation takes pride in its publications. We are sure that our manuals will fill all of your needs when you are performing scheduled maintenance, servicing, or repairs on a Midmark product.

However, if you find any errors or feel that there should be a change, addition, or deletion to a manual, please let us know!

Page(s) and Paragraph(s) Needing Changed:

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FAX ORDERING FORM
(SERVICE PARTS ONLY)

Do not tear out this page. Photo copy this page for use only

NOTES:

- **ALL BLOCKED AREAS MUST BE COMPLETED.**
- **USE FOR NON-WARRANTY FAX ORDERS ONLY. WARRANTY ORDERS MUST BE TELEPHONED IN (1 - 800 - MIDMARK).**

ATTENTION: SERVICE DEPARTMENT FAX #: 877 - 249 - 1793

ACCT #: _____	**P.O.#** _____	**DATE:** ___/___/___
NAME: _____	**SHIP TO:** _____	
ADDRESS: _____	_____	
CITY, STATE: _____	_____	
ZIP CODE: _____	_____	
CONTACT: _____	_____	
PHONE: _____	_____	

☐ **NON-EMERGENCY ORDER - TO SHIP WITHIN 72 HOURS IF PART(S) IN STOCK.**

☐ **EMERGENCY ORDER - TO SHIP WITHIN 24 HOURS IF PART(S) IN STOCK (IF ORDER RECEIVED BEFORE 1:30 P.M. E.S.T.).**

SEND NOTIFICATION IF PARTS ARE NOT AVAILABLE TO SHIP WITHIN 24 HOURS VIA E-MAIL OR FAX TO: _____

METHOD OF SHIPMENT

UPS	**FED EX**	**OTHER:**
☐ NEXT DAY A.M.	☐ NEXT DAY A.M.	_____
☐ NEXT DAY P.M.	☐ NEXT DAY P.M.	_____
☐ 2ND DAY	☐ 2ND DAY	_____
☐ GROUND	☐ ECONOMY	_____

QTY	PART NUMBER	DESCRIPTION (SPECIFY COLOR OF ITEM IF APPLICABLE)	COLOR CODE	PRICE / PER

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P.O. Box 286
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